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## THESIS

**BEGINNER'S USER GUIDE FOR THE  
MAGTF  
TACTICAL WARFARE SIMULATION**

by

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June 2000

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**BEGINNER'S USER GUIDE FOR THE  
MAGTF  
TACTICAL WARFARE SIMULATION**

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Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF SCIENCE IN SYSTEMS TECHNOLOGY  
(COMMAND, CONTROL, AND COMMUNICATIONS)**

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## ABSTRACT

The MAGTF Tactical Warfare Simulation (MTWS) is a multi-sided computer based gaming system, currently in use by the Marine Corps. Marine operations typically involve movement over land, sea, and air, and sustained operations often involve interaction with other services. MTWS's complexity supports the joint warfare nature of Marine Corps operations. This capability and complexity makes it ideally suited for an academic environment, and at the Naval Postgraduate School MTWS introduces students to a current service simulation, reinforces student coursework, and facilitates student research and experimentation. The drawback of a system so complex, though not difficult to learn how to use, is that MTWS is not always intuitive. While extensive documentation exists to support the system, it is for experienced users of the system. This thesis is tailored toward beginning users, no matter their level of operational experience, and will bridge the gap to the advanced documentation. It provides an overview of the system, explains graphical user interfaces (GUIs), provides instructions on how to develop and utilize units in the simulation, and furnishes reference charts for current U.S. weapon systems.

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## EXECUTIVE SUMMARY

The MAGTF Tactical Warfare Simulation (MTWS) is a multi-sided computer gaming system, currently in use by the Marine Corps. Due to the complex nature of Marine Corps operations, MTWS supports the full range of military operations and is a capable simulator of joint military warfare and operations.

The complexity and joint nature of MTWS makes it ideally suited for an academic environment. MTWS has been fielded at the Naval Postgraduate School (NPS) in March of 1996. Since this time it has proven invaluable by providing students with exposure to a current service simulation, reinforcing coursework, and facilitating student experimentation. Additionally, NPS is developing an Asynchronous Distance Learning (ADL) program that is centered upon MTWS and its ability to interact with the Global Command and Control System (GCCS) and the Joint Maritime Command Information System (JMCIS).

Complexity is the strength of MTWS, but is also its drawback. While not difficult to learn how to use, the system is not always intuitive. There exists extensive documentation to support MTWS, but it does not benefit beginning users. This thesis will bridge the gap to the advanced documentation. The thesis will provide an overview of the system, explain screen layout, graphical user interfaces (GUIs), provide step-by-step instructions on developing and utilizing units in the simulation, and provide reference charts on symbology and current U.S. weapon platforms. It is tailored toward beginning users, no matter their operational background or service branch, and will guide them to a basic level of proficiency.

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## **I. INTRODUCTION**

The Marine Air Ground Task Force (MAGTF) Tactical Warfare Simulation (MTWS) is a multi-sided computer-based gaming system currently utilized by the Marine Corps. Due to the complex nature of Marine Corps operations, MTWS supports the full range of military operations and is ideally suited to simulate joint military warfare. The increasing importance of joint military operations makes MTWS a worthy simulation for utilization and experimentation.

### **A. HISTORY**

MTWS was developed as a successor to the Tactical Warfare Simulation, Evaluation, and Analysis System (TWSEAS), a system fielded in 1976. MTWS development started in 1990 and was fielded in 1995. [Ref. 1] MTWS is largely built upon the capabilities of TWSEAS, the most significant improvement being the use of open system standards and modern, commercial-grade Unix computers rather than militarized computer systems. TWSEAS utilized the AN/UYK-7 computer which represented 1960's technology, characterized by slow processing, textual input/output, teletype printers, expensive graphics display systems, and cumbersome monochrome displays. Additional improvements



over TWSEAS include enhancements to combat models that cover all major combat areas as well as modeling environmental factors, combat damage, logistics, fatigue, and intelligence reports. [Ref. 2]

The multi-sided gaming capability of MTWS adds realism to the simulation. MTWS allows for up to 26 workstations to be networked into a single gaming session in its standard configuration but has been networked with as many as 75 workstations in large joint exercises. [Ref. 3]

#### **B. SYSTEM CONFIGURATION**

An MTWS network consists of three types of computers, with at least one of each present in the network for the simulation to run. The MTWS System Control (MSC) is the primary interface unit that creates, loads, and controls simulations. Only one MSC is utilized in a network. [Ref. 4]

The MTWS Application Network (MAN) runs the simulation. A network can operate with only one MAN, but generally there are more, seven being the most. Utilizing multiple MANs allows for the distribution of combat models among them, which balances the load of the network and prevents a slowing of the simulation.

The MTWS Display Station (MDS) is the user interface with the simulation. The MDS displays the simulation and

allows the user to interact with it through command entries. MDSs in a network can number anywhere from 1 to 75.

Connectivity in an MTWS network is done through standard Ethernet connections. On the MSC there are two Ethernet ports; this allows connections to both the MAN and the MDS. The MSC is the heart of the network, and all information passed between the MAN and the MDS passes through the MSC. [Ref. 5]

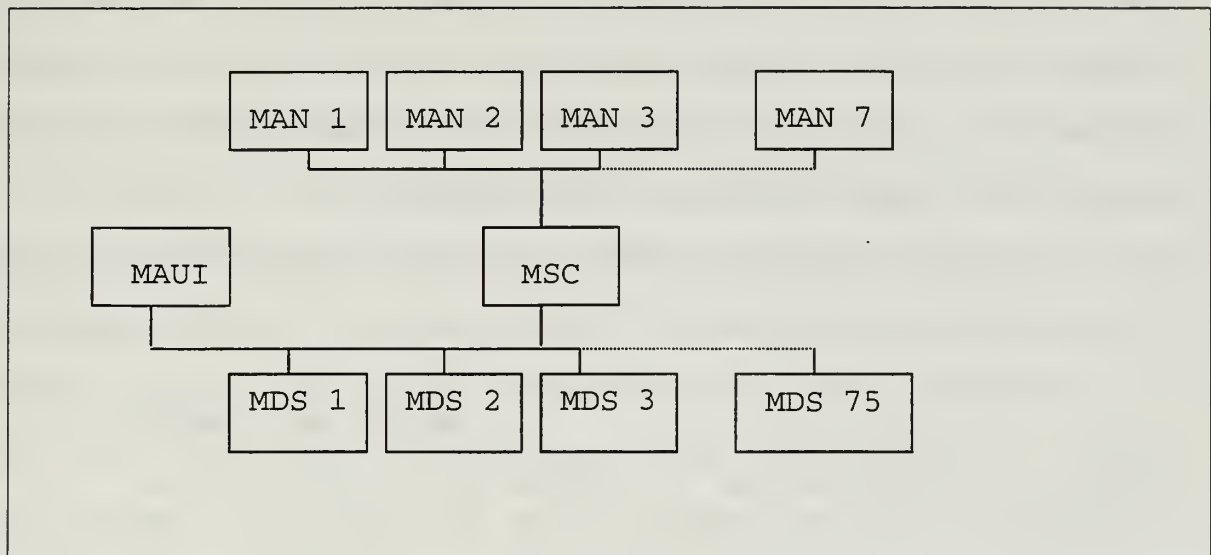


Figure 1. MTWS Network Configuration

The personal computer (PC) version of MTWS is called MTWS Advanced User Interface (MAUI). MAUI terminals and Unix-based MDS terminals can be networked in a simulation without any special configurations or hardware, just the Ethernet connections. [Ref. 6]

### C. INTENDED USE OF THE SYSTEM

The designed use for MTWS is to train Marine Corps commanders and their staffs, primarily in Command Post Exercises (CPX). In this capacity, MTWS would be fielded near, but separate from, a commander's staff. The staff would conduct an exercise directing fictitious units. Receiving the commands via radio nets, would be company command grade officers who would then enter the commands into MTWS. As the commands are entered, utilizing the Spot Reports of the system, the station operator (e.g., company commander) provides the staff with feedback and situation reports of their command of the exercise.

In Field Exercises (FEX), MTWS was intended to be used in conjunction with actual fielded units. In this scenario, the commander and the staff would direct the fielded units while technicians or specialists listened to the communications and reports from the exercise umpires and replicated the action of the units in the system. Battle damage assessments would be computed by the system and relayed to the umpires. In FEXs, the MTWS system can record and replay the action of the exercise.

Until recently MTWS had not been utilized in the FEX mode but is often used in CPXs. [Ref. 7] Though it was intended for Company Commanders or equivalent officers to man the terminals for CPXs, the complexity of the system

requires a military support staff plus additional support from civilian technicians. In both CPXs and FEXs, MTWS is a tool to evaluate the performance of the commander and his staff. In addition to evaluation and tactical training, MTWS can also be a planning tool to develop courses of action for tactical operations or to simulate other realistic situations such as a coalition warfare scenario.

With single person or multi-person teams at each terminal, a gaming session could have a red and blue force as well as several non-aligned forces. Each force can be acting independently and seeking their own interests and objectives. Coalition warfare can be simulated with red and blue forces competing to form alliances with the non-aligned forces.

#### **D. CURRENT USE AT NPS**

Due to the complex nature of Marine Corps operations, and thus the complexity of any simulation of it, MTWS is ideally suited for an academic environment. Marine Corps operations generally utilize movement through land, air, and sea, all within a single operation. Because the Marines operate in coordination with the Navy and do not typically operate unsupported for extended periods of time, Marine Corps operations are also commonly joint warfare operations. MTWS replicates this joint nature of Marine operations by containing Army, Air Force, and Navy platforms and weapons

within its parametric database. Users can utilize any of these weapons or platforms in their simulations therefore the simulations can be centered on a branch of service other than the Marine Corps.

MTWS is currently fielded at the Naval Postgraduate School (NPS) in part by the Office of Naval Research, where it is used to conduct human-in-the-loop experiments as part of the Adaptive Architectures for Command and Control research program. It is supported by the Joint Command, Control, Communication, Computer, and Intelligence (JC4I) Curriculum and the Institute for Joint Warfare Analysis within NPS. MTWS provides JC4I students with exposure to a current and joint natured simulation that reinforces coursework and facilitates student experimentation.

NPS is developing an Asynchronous Distance Learning (ADL) program that will provide fleet personnel an inexpensive method in which to train in C4I and collaborative planning skills from remote locations. MTWS interfacing with C4I systems will be the basis of this training. [Ref. 8]

#### **E. FUTURE OF MTWS**

Currently there is an effort within the Department of Defense to develop the Joint Simulation System (JSIMS), a joint warfighting simulator for use by all branches of service. The joint nature of MTWS makes it a strong



candidate for an interim system until JSIMS is fielded. Capitalizing on this strength the developers of MTWS, Visicom, have begun to market the system internationally as the Joint Tactical Warfighting Simulator (JTWS). This is an effort to make the system desirable for foreign governments in search of a joint simulator for their own militaries. [Ref. 9]

Recent technical improvements to the system include a personal computer (PC) based user workstation vice the current Unix-based one. Use of PC-based networks will lower costs and allow for more flexibility. Unix-based networks are generally more expensive to operate and require specialized administrators. The new PC version, the MTWS Advanced User Interface (MAUI) is currently in beta testing. [Ref. 10]

There are numerous planned upgrades to the software, but the most significant underway are the C4I system interfaces. Under development is the ability for MTWS to import units and platforms into the Joint Maritime Command Information System (JMCIS) and the Global Command and Control System (GCCS). Fictitious scenarios could be played out on GCCS/JMCIS terminals networked with MTWS. A new level of realism would be injected into simulation when real world command and control systems are utilized during exercises.[Ref. 11] To date, one interface that has been



developed is the ability for MTWS to provide GCCS with Over The Horizon Targeting (OTH-Gold) and US Message Text Format (USMTF) message reports to stimulate the C4I system. [Ref. 12]

#### **F. PURPOSE OF THESIS**

The strength of MTWS is also a major drawback, complexity. While there is an abundance of documentation for the system, it is not intended for beginning users. Further complicating first time use is that the system, while not difficult to use, is not intuitive.

The purpose of this thesis is to bridge the gap to the advanced documentation that is available. This first time user's guide can be used in conjunction with instruction by a knowledgeable user or can be used as a self-instruction guide. Instructions are developed for users from any service branch no matter their operational background. This thesis will provide an overview of screen displays and their purposes, developing and utilizing units, glossary of terms, and charts for weapon, radar, and platform compatibility. Information is tailored toward U.S. forces and current U. S. weapon systems.

#### **G. ORGANIZATION OF THESIS**

This thesis, as a whole, is designed to be an instruction manual for MTWS version 2.1, released in

December, 1999. The structure of it is as follows: Chapter I provides background, history, and application of the system. Chapter II gives an overview of the basic layout and functions of the user display. Chapter III provides detailed instruction on how to develop and utilize units in the simulation. Appendices provide charts of platform weapons, aircraft/weapon/fuse compatibility, unit icon identification, and instructions on starting both an MDS terminal, and the MSC. A glossary of MTWS related acronyms and abbreviations is included as well.

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## II. OVERVIEW OF SYSTEM

At system start-up, MTWS displays four windows and seven icons (see Figure 1). The windows are the MTWS Tactical Display Window, Spot Reports, Status Window and the Command Entry. Icons are MTWS User, MTWS Display System (MDS) I/O, MTWS Display System Command Entry (MDSCE), Alert, MTWS System Control, MTWS System Operation, and Interstation Communication. This section will explain the purpose and functionality of these screen features.

### A. MTWS TACTICAL DISPLAY WINDOW

The MTWS Tactical Display Window is the graphical display of the simulation. A world map is the center of the window, graphical user interfaces (GUI) are along the top, and information concerning the size and center of the map display, is across the bottom. Information conveyed across the bottom of the map display concerns the center and size of the map projection, in the following format:

**Proj:**Mercator    **Center:**[lat long] [UTM]    **Width:**[NM].

Mercator is the type of map display, UTM is Universal Transverse Mercator (an alternative coordinate system to

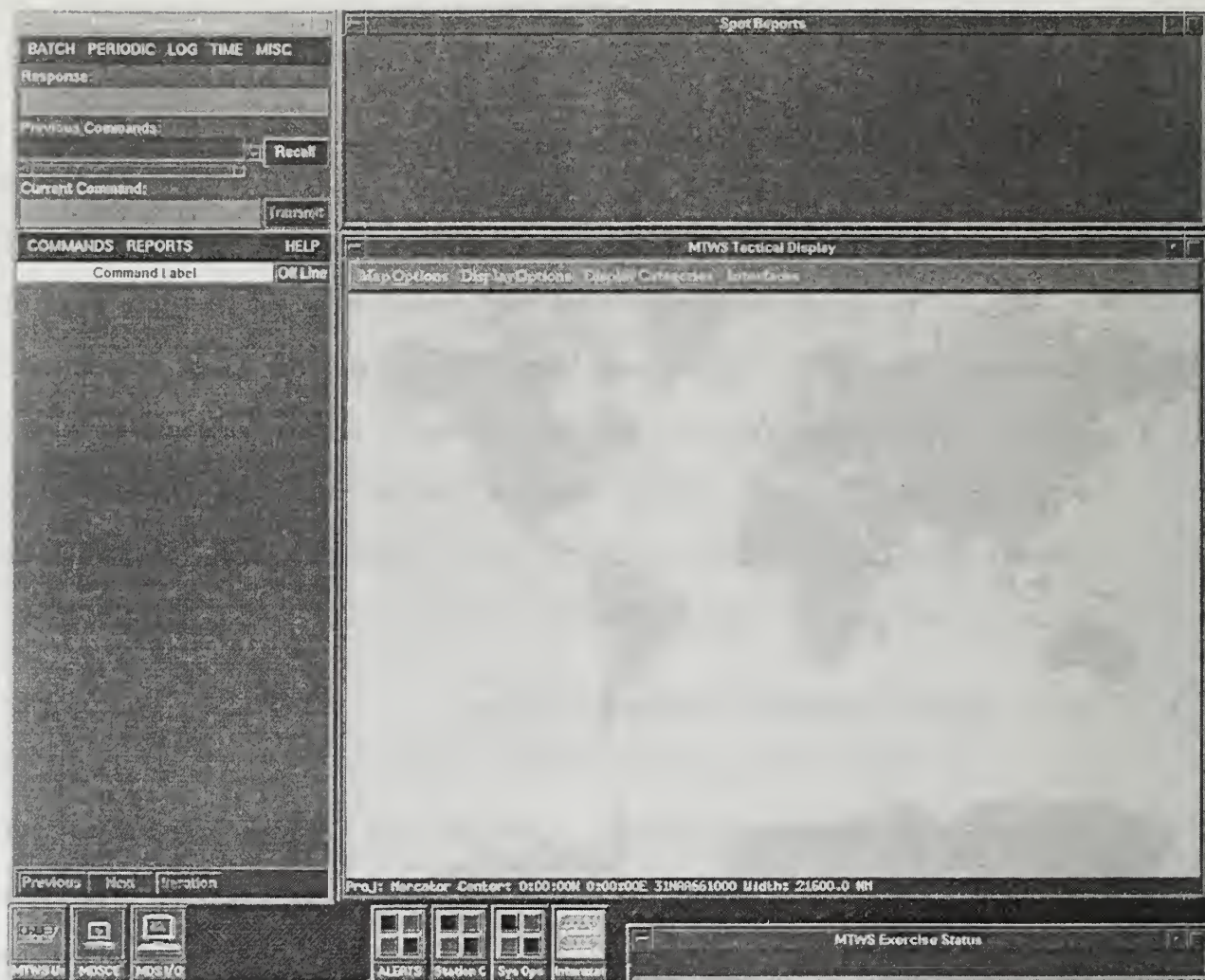


Figure 1. MTWS Start-up Screen.



latitude longitude primarily used for ground operations), and NM is Nautical Miles. When a user left clicks the mouse on the map display, a mark will be left on the display. The information bar will briefly display information concerning the location of the mouse mark:

**Location:** [lat long] [UTM]      **Elevation:** [meters].

Left mouse clicks leave a mark on the map display. Click marks serve the purpose of marking waypoints for unit movements, placement of units into the display, and indicating target locations for fire missions.

The following menu options are at the top of the MTWS Tactical Display moving from left to right. These interfaces allow the user to manipulate the map display and will provide the user with information about what is displayed.

## **1. Map Options**

### **a. Zoom In**

Click on region that is desired to be enlarged. Shape box to area then double click to zoom.



**b.    *Zoom Out (x5)***

Automatically zooms out to area five times what is currently displayed.

**c.    *Half Scale***

Automatically scales map to half of what is currently displayed.

**d.    *Double Scale***

Automatically increases scale of map to double what is currently displayed.

**e.    *Manual Scale***

Allows for manually scaling field of view. User can adjust center and width of map display.

**f.    *World View***

Automatically returns map to full worldview, identical to what appears when simulation is started.

**g.    *Predefined Maps***

Lists maps that have been selected for an exercise or simulation. Selecting one from the available options will move the display to that map.

#### ***h. Re Center***

Map will re-center on point selected by user. Click mouse pointer on spot desired to become new center of display.

#### ***i. Hand Pan***

Allows slight adjustments of map display with the mouse pointer. When map is in desired position, click mouse.

#### ***j. Range Bearing***

Click on point from which you want to reference distance. Move mouse pointer to the other location and click the mouse again. A range line and a blue box with distance data will appear. Click on the box to remove it and the distance line.

#### ***k. Coordinates***

As the mouse pointer moves across the display, map coordinates will appear in a box adjacent to it. Double clicking mouse will remove it.

#### ***l. Group***

This option has no functionality associated with it.

***m. Map Features***

Allows users to add latitude longitude lines or political boundaries to the map display.

***n. Intensity/Contrast***

Allows for adjustment of intensity and contrast in the display.

***o. Map Countries***

Each country is designated with a two-letter abbreviation. Click on a box, the country associated with the two letters will be identified. If the box is red the option is available to adjust the color of that particular country in the map display. If the box is white, that option is not available.

***p. Map Manager***

Imported digitized maps are accessed through this function. User has the option to scroll through the maps or to view maps by type. A box will appear on the display that will show exact region that the digitized map covers. Selecting + will display a selected map, - will remove it.

***q. Auto Digitized Maps***

When user is zoomed into a region, selecting this option will layer all available digital maps of that region,

into the display. As user zooms in closer, or out, any available maps that better suit the new scale will appear.

***r. Elevation Legend***

Selection of this option will present a color elevation legend into the left-hand corner of the display.

***s. Depth Legend***

Selection of this option will present a color depth legend in the right hand corner of the display.

***t. Map Connections***

Utility to select a specific map server that is connected to the network.

***u. CD ROM Status***

Displays the status of a workstation's CD ROM drive.

***v. Overlays Status***

Lists overlays that have been created and saved to disk. Overlays can be created, recalled or edited with this function.

## **2. Display Options**

### **a. Locate**

A function to locate units or objects. Unit names may be entered and the location of the desired unit will be provided. Additionally, this is a method of quickly filtering display to show missions, tracks, or objects.

### **b. Identify**

Identifies unknown units or objects. Click on icon and system will identify it by name and provide mission and engagement status information as well.

### **c. Coord Util**

Computes conversions between latitude/longitude and UTM coordinates.

### **d. Range Fans**

Draws range fans around objects. Enter either latitude/longitude or UTM coordinates, range in either nautical miles or kilometers, and then the degrees of the fan. Click draw to display the fan.

### **e. Tactical Update Times**

Allows users to view the times at the which system's tactical picture was updated by the MTWS System Control (MSC).

***f. Small Font***

This is grayed out and has no functionality associated with it.

***g. Large Font***

This is grayed out and has no functionality associated with it.

***h. Clear Locations***

Clears left click mouse marks from map display.

***i. Restore Map Colors***

This option has no functionality associated with it. In earlier versions of MTWS, map display colors could be manipulated.

**3. Display Categories**

The simulation facilitators will likely coordinate the functions under Display Categories. These functions provide filters to what is displayed at a workstation.

***a. Display Objects***

Filters specific objects, tracks, units or events from a workstation.



**b. Display Environment**

Filters for units assigned to specific control functions. Additionally, filters can be applied to display only Landing Forces, Aggressors, Neutrals, etc.

**4. Interfaces**

**a. C4I Systems**

Function will activate transmission of C4I formatted messages to real-world systems on networks (e.g., Global Command and Control System). Will also allow users to view OTH and USMTF messages sent or read.

**B. SPOT REPORTS WINDOW**

Spot reports are messages conveyed by the system, informing of relevant battlefield developments. Information conveyed includes: air mission launches, enemy detections, engagements, battlefield damage assessments, and casualties. Spot Reports follow the same general format: what the message is about, the mission it concerns, current position of the mission, the DTG of the message, the controller that monitors the unit, and the specific action taking place. The following is an example of a Spot Report:

AIR MSN RTB; SORTIE 1; 11PKN49493; 252037ZMAY00

AIRCON; AIR MISSION HAS REACHED BINGO; AIR MISSION WILL RTB

AIR MSN RTB refers to the type of Spot Report that is being displayed. SORTIE 1 is the unit or mission that Spot Report concerns. 11PKN49493 is the UTM point that the unit or mission is located, and 252037ZMAY00 is the DTG of this Spot Report. AIRCON is the controller that the unit or mission is associated with. AIR MISSION HAS REACHED BINGO; AIR MISSION WILL RTB conveys the event that has taken place, the purpose of the Spot Report. Bingo is the point in time when an air mission has only enough fuel to return to base, and RTB is an acronym for return to base.

#### **C. MTWS COMMAND ENTRY WINDOW**

The MTWS Command Entry Window develops and manipulates units in the simulation. Objects are built and missions established. Familiar buttons appear when using the Commands function: "Next" for accessing the next screen, "Previous" to return to the previous screen, "Iteration" for multiple entries such as waypoints for a flight path, "Transmit" enters current command into the simulation, "?" for information about the current Commands data window, "..." expands menu to allow user to view and select from all possible options, and "FORMAT" allows users to select a

format when entering information. Generally, FORMAT selections are LAT/LON, UTM, TACAN, or NAME, but may be tailored toward specific data fields.

## **1. Batch**

This command is for more advanced use of the system, generally used in large exercises. Batch commands create a file containing multiple, predefined commands, often used to initialize a scenario or exercise. A simple example of a Batch File is one that, when initiated, would introduce into the Tactical Display all the Aggressor units for the current exercise or scenario.

## **2. Periodic**

Allows user to predefine reports that will be generated at predetermined intervals. An example of possible use may be creating a report of the ammunition of an artillery battery, allowing the monitoring of ammunition supplies as they are decremented. Another example may be a report to monitor the number of casualties of a ground unit as it

engages the enemy. This function is used in conjunction with the Reports command.

### **3. Log**

Log is a tool for administrators and simulation facilitators. It creates a log of all valid commands entered during an exercise.

### **4. Time**

Time is a function that is utilized in conjunction with Batch. This allows batch files to be phased into a scenario over time. It creates more realistic scenarios by phasing in unit defining and unit mission commands at different, predetermined intervals.

### **5. Misc**

This contains Print Enable, Print Disable, and History functions. History is a log of all previous Command Entry commands that were transmitted. Note that a command is not considered transmitted unless the system accepts it as a valid command. When the log appears, options available include Transmit, Recall, and Close. Transmit will

retransmit a selected command. Recall will bring the selected command back to the workstation. Select Close to close the log and view the selected command.

## **6. Commands**

The Commands function is where units are defined and missions are developed. The Commands function is covered in Chapter III of this guide.

## **7. Reports**

This allows the user to view reports tailored to the different warfare areas contained within the Commands function. Available reports are numerous and include: schedules, assets of units, unit attachments, task forces, predefined ordnance loads, track data, scheduled fire missions, and mission status reports.

## **8. Help**

Two options available in Help are General and Current Command or Report. The "?" information option is different from Help in that it is tailored to a specific parameter

within a Command and Help is information about the Command as a whole.

#### **D. MTWS EXERCISE STATUS WINDOW**

This window provides the current status of the simulation. The format for the information is:

| <b>Exercise Name</b> | <b>State:</b> | <b>Mode:</b> | <b>Rate:</b> | <b>Time:</b> | <b>DTG</b> | <b>DTG</b> |
|----------------------|---------------|--------------|--------------|--------------|------------|------------|
|----------------------|---------------|--------------|--------------|--------------|------------|------------|

Exercise Name is the name of the exercise that is currently loaded in the system. State is the current status of simulation, whether it is in Run, Replay, or Admin. Mode has three options, Normal, Resume, or Suspend. Rate is the simulation rate and can run between 0.0 and 10.0. Following Time there are two entries in the DTG format. One DTG conveys zulu time, the other may convey local time if the exercise or simulation is set up to run on it.

#### **E. MTWS USER ICON**

This icon does not appear on all versions of MTWS; this is not a function of MTWS, but rather a function of the workstation. It contains tools for the workstation such as Email, Text Editor, Terminal Lock, File Manager, Spell



Checker, Clipboard, and multiple others. These functions do not interact with the simulation.

**F. MDS I/O ICON**

This is a log of communications between the MDS and the MSC. It is primarily a tool for system administrators.

**G. MDSCE ICON**

Like MDS I/O, this is also a tool for system administrators to monitor and troubleshoot the system.

**H. ALERT ICON**

The Alert window conveys network administration information, specifically concerning network communications and errors.

**I. MTWS STATION CONTROL ICON**

The MTWS Station Control window allows users to adjust the user level of the terminal, arrange for how Spot Reports are conveyed, and place the workstation on or off line.

#### **J. MTWS SYSTEM OPERATIONS ICON**

Selecting EXERCISE CONTROL>>ASSIGN/DEASSIGN allows users to select or deselect controllers that will be displayed on the workstation.

#### **K. INTERSTATION COMMUNICATION ICON**

Interstation Communication is an email function in which messages can be conveyed to all stations under specific controllers or messages can be broadcasted to all workstations. When a workstation has email, the icon will change color. As of MTWS version 2.1 this functionality has been disabled and may be removed in future versions in favor of a standard email program. [Ref. 13]

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### III. MTWS COMMAND ENTRY INSTRUCTIONS

This chapter will provide detailed instructions on developing and utilizing units. Combat areas that will be covered in this section include: air operations, ship operations, amphibious operations, ground operations, combat engineering operations, and combat support operations. A couple of the most common Reports commands will be covered as well.

In addition to the instructions in this section, guidelines for understanding button functions and graphical user interfaces are covered in Chapter II, within the MTWS Command Entry Window section.

For the instructions in this chapter, commands involving manipulating GUIs are in the format of COMMANDS>>GROUND>>UNIT>>DEFINE. Statements preceding colons are titles of fields for data entry. Information following the colon are guidelines for entering data. Not all fields require data; if there is nothing following the colon, then it is recommended that the field remain blank. Fields that require data have a req (required) to the top right of the data field; if there is an opt (optional) then data is not required.

**A. TABLE OF ORGANIZATION/TABLE OF EQUIPMENT (TO/TE)**

TO/TE is Table of Organization/Table of Equipment. MTWS's parametric database has predefined organizational structures and equipment for units, as well as platform and weapon performance characteristics.

If a user tries to define a unit that does not fit the predefinition then an error will occur and the command will not be accepted as valid. For instance, an error will occur if a user tries to station a Navy squadron aboard an aircraft carrier, because the parametric database does not have a Navy squadron defined within it, as it is tailored toward USMC units. The user has two options to overcome this: a USMC squadron can be stationed aboard the carrier, or "NO" can be selected for TO/TE. Selecting "NO" overrides the parametric database and allows the user to utilize any combination of equipment, alliance, and/or service branch.

While the parametric database is tailored toward USMC units, it is also evolving and will eventually better incorporate units of other services. Meanwhile, users can utilize the parametric database to develop units tailored to their needs, such as a Navy squadron. The database is easily changed and will allow for changes in performance characteristics of platforms and equipment.

## B. INVALID COMMANDS

When a command is accepted by the system, in the Response data field, a Valid message will appear. An invalid message will be in the format:

Invalid: (PN:14) Invalid Table of Organization, Unit Define Command is Rejected.

To determine what field the error occurred in, verify data in the Current Command data field. For the above example, the Current Command field contained:

```
UNIT; DEFINE; ARTY1; LF; ARTILLERY; BATTERY; 105SES752211;  
ARTYCON1;; SIMULATED; FALSE; YES; USMC; MLRS; $
```

Viewing the data beginning to end, it is a Unit Define command. The name of the unit is Arty1, an artillery battery at position 105SES752211, and the selected Control Function is ARTYCON1. The two semi-colons represent a data field that did not require data and was therefore left blank. The beginning of the error message stated PN:14, meaning position number 14. Place the cursor in the field, move to the beginning and begin counting out 14 positions.



Including the empty data field, represented by the two semi-colons, this will take you to MLRS. The error is a Table of Organization error because the USMC does not utilize the MLRS weapon system, and is therefore not represented in the parametric database.

#### **C. CONTROL FUNCTION**

Control Function is a required field when defining a unit in MTWS. When a Control Function is selected for a unit, the user must verify that the workstation is configured to receive reports from the selected Control Function. When a Control Function is selected and the workstation properly configured, reports will be received in the Spot Reports window. Double click the MTWS System Operation icon, then select EXERCISE CONTROL>>ASSIGN/DEASSIGN, to select or verify selected controllers displayed by the workstation. Generally, simulation facilitators or exercise controllers will establish Control Functions. Utilizing Control Functions allows for the simulation of command and control hierarchies, and data and communication links.

#### **D. AIR OPERATIONS**

This will provide instructions on establishing airfields and aircraft carriers, the two options for launching air missions. In addition to these, several other

commands must be entered into the system before air missions can be successfully entered. A squadron needs to be defined, assigned to an airfield or aircraft carrier, then outfitted with aircraft. Air missions carrying out a mission other than airborne early warning or reconnaissance require an ordnance load; therefore ordnance loads must be established before a mission is defined. Finally, when these entries have been made, the system will accept an air mission.

## **1. Airfields**

Developing an airbase involves four sets of commands. First an airfield is established, then an aviation ordnance supply unit. The airbase will also require fuel, and the supply unit has none until it is allocated with the Assets Update command. Finally the airfield and supply base are associated together with the Link Airfield command. If you are unable to link the airfield and supply unit together it is most likely a result of the units being located too far apart. Utilize the `COMMANDS>>GROUND>>UNIT>>LOCATE` command to place them in closer proximity.

**a.     *Airfield***

**COMMANDS>>AIR>>AIRFIELD>>DEFINE**

**Airfield ID:** Enter desired airfield name

**Airfield Location:** Place mark on map display for desired location of airfield

**Status:** OPEN

**Ordnance ID:**

**Fuel ID:**

**Air Squadrons ID(s):**

**NEXT**

**Runway ID(s):**

**Ownership:** MTWS\_OWNED

**TRANSMIT**

**b.     *Aviation Supply Unit***

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired name of supply base, recommend Airfield Name + Supply (i.e., Ocean Supply)

**Side Txt:** LF

**Unit Type:** Select SUPPLY

**NEXT**

**Hierarchy:** COMPANY

**Unit Location or Ship ID:** Place mark on map display, very close to airfield, for location of supply base

**Control Function:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**Use TO/TE:** YES

**NEXT**

**Service/Alliance/Country:** Select USMC

**Supply Sub Type:** Select AV\_ORD

**TRANSMIT**

### **c.    Aviation Fuel Allocation**

**COMMANDS>>GROUND>>ASSETS>>UPDATE**

**Unit or Cargo ID:** Enter supply unit name

**Asset Category:** Select FUEL

**NEXT**

**Gallons of Fuel Pos or Neg Integer:** Recommend entering very large number (i.e., 1000000)

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

**TRANSMIT**

### **d.    Airfield Link**

**COMMANDS>>AIR>>AIRFIELD>>LINK**

**Airfield ID:** Enter Airfield name

**Ordnance Unit ID:** Enter name of associated Supply unit

**Fuel Unit ID:** Enter name of associated Supply unit

**Air Squadron ID(s):** Enter name of associated Squadron(s)\*

**Runway ID(s):**

**TRANSMIT**

\*If user has not yet defined associated squadron(s), then leave this field blank

## **2.    Aircraft Carriers**

Unlike an airbase, an aircraft carrier does not require a fuel and aviation ordnance supply depot; the carrier serves as its own supply source. For ship operation commands, refer to the ship operations section of this chapter.

**a. Aircraft Carrier**

COMMANDS>>GROUND>>UNIT>>DEFINE

Unit ID: Enter desired Carrier Name

Side Txt: LF

Unit Type: Select SHIP

NEXT

Hierarchy: COMPANY

Unit Location or Ship ID: Place mark on map display for desired location of ship.

Control Function: Select desired Control Function

Display Name:.

Real or Simulated: SIMULATED

NEXT

Lids Equipped: FALSE

TO/TE: YES

Service: Select USN

Ship Sub Type: Select between JFK (conventional), and NIMITZ (nuclear) class carrier.

TRANSMIT

**b. Aircraftcarrier Airfield**

COMMANDS>>AIR>>AIRFIELD>>DEFINE

Airfield ID: Enter name of aircraft carrier

Airfield Location: Again, enter name of aircraft carrier

Status: OPEN

Ordnance ID:

Fuel ID:

Air Squadrons ID(s):

NEXT

Runway ID(s):

Ownership: MTWS\_OWNED

TRANSMIT

### 3. Squadrons

Following the defining of an airbase or aircraft carrier, a squadron needs to be assigned. This section will cover defining the squadron, then outfitting it with aircraft. When the squadron is complete assign it to an airfield, utilizing the AIRFIELD>>LINK command to attach it.

#### a. Squadron

**COMMANDS >> GROUND >> UNIT >> DEFINE**

**Unit ID:** Enter desired squadron name

**Side Txt:** LF

**Unit Type:** Select AIR SQUADRON

**NEXT**

**Hierarchy:** Select SQUADRON

**Unit Location or Ship ID:** Enter name of carrier or airbase that squadron will be stationed at

**Control Function:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**Use TO/TE:** YES

**NEXT**

**Service:** Select USMC \*

**Air Squadron Type:** Select desired type of squadron

**TRANSMIT**

\*No matter what type of aircraft or whether squadron will be based upon aircraft carrier, there will be less likelihood of Table of Organization type error if USMC is selected.



***b. Squadron Aircraft***

**COMMANDS>>AIR>>AIRCRAFT>>DEFINE**

**Aircraft Type:** Select desired aircraft type from menu

**Squadron ID:** Enter desired name of squadron

**Mode 2 IFF:** Enter 4 digit number

**Definition Method:** Select QUANTITY\*

**NEXT**

**Number of Aircraft:** Enter desired number of aircraft type for squadron.

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

**TRANSMIT**

\*Choosing Quantity, MTWS will assign side numbers for each aircraft. Selecting Individual will result in the user assigning side numbers for each aircraft.

***c. Squadron/Aircraftcarrier Link***

**COMMANDS>>AIR>>AIRFIELD>>LINK**

**Airfield ID:** Enter airfield name

**Ordnance Unit ID:**

**Fuel Unit ID:**

**Air Squadron ID(s):** Enter name of associated squadron(s)

**Runway ID(s):**

**TRANSMIT**

#### 4. Ordnance Loads

Ordnance loads are required for air missions, therefore an ordnance load must be established prior to defining the air mission. When developing them, ordnance loads need to be tailored to the aircraft they will be employed on.

**COMMANDS>>ORDNANCE\_LOAD>>DEFINE**

**Ordnance Load ID:** Enter desired name of ordnance load

**Side:** LF

**NEXT**

**Ordnance Type:** Select desired ordnance type\*

**Number of Ordnance:** Enter desired number of specified ordnance type

**Fuse:** Select desired type of fuse

**ITER\*\***

or

**TRANSMIT\*\***

\*Refer to compatibility charts for aircraft/ordnance/fuses, located in Appendix A

\*\*If more than one type of ordnance is desired for a Ordnance Load, then select Iteration, otherwise select Transmit

## 5. Ground Radar Activation

### a. Radar Allocation

COMMANDS>>GROUND>>ASSETS>>UPDATE

**Unit or Cargo ID:** Enter name of airfield

**Asset Category:** Select ASSET

NEXT

**Asset Type:** Select desired radar type from menu

**Quantity of Asset:** Enter 1

**Asset Damage Category:** Select OPERATIONAL

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

TRANSMIT

### b. Radar Field Defined

COMMANDS>>INTELLIGENCE>>SEARCH\_RADAR>>DEFINE

**Radar Field ID:** Enter name of radar field, recommend Airfield Name +\_Radar, i.e. Ocean Radar

**Radar Field Location:** Place mark on map display at airfield that radar is desired

**Radar Type:** Select type that was previously allocated

**Responsible Unit:** Enter name of airfield

TRANSMIT

### c. Radar Activated

COMMANDS>>INTELLIGENCE>>SEARCH\_RADAR>>ACTIVATE

**Search Field ID:** Enter name used in Radar Field ID, i.e. Ocean Radar

TRANSMIT

## 6. Air Missions

Missions covered as examples are airborne early warning (AEW), attack, and combat air patrol (CAP).

### a. Airborne Early Warning

E-2Cs are used if the mission originates from an aircraft carrier and E-3s when from an airfield. Usually, an AEW mission is performed in a high altitude orbit.

COMMANDS>>AIR>>AIR\_MISSION>>DEFINE

**Frag Number:** Enter desired name for mission

**Aircraft Type ID:** Select E-2C for carrier originated mission, or E-3 for mission from airfield

**Number of Aircraft:** Select desired number of aircraft for mission, generally only 1 is needed

**Squadron ID:** Enter name of AEW squadron

**Take-off Point:** Enter either carrier or airfield name

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:**

NEXT

**Mission Type:** Select AEW

NEXT

**Timed Event:** TAKE\_OFF

NEXT

**Take-off Time:** Leave blank for immediate launch or DDHHMMZMMMY for desired launch time

NEXT

**Location:** Place mark on map display for desired location of orbit point

**Altitude:** Recommended the HIGH be selected for AEW mission

**Point Definition:** Select ORBIT

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

TRANSMIT

**b. Combat Air Support (CAS)**

For a CAS mission there must be a supported unit, and failure to fill in the Supported Unit data field will result in an error.

**COMMANDS>>AIR>>AIR\_MISSION>>DEFINE**

**Frag Number:** Enter desired name for mission

**Aircraft Type ID:** Select squadron aircraft type

**Number of Aircraft:** Enter desired number of aircraft for mission

**Squadron ID:** Enter squadron name

**Take-off Point:** Enter airfield or carrier name

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:** If the mission is Combat Air Support, this field requires an entry. Enter name of unit the mission will support.

**NEXT**

**Mission Type:** Select CAS

**NEXT**

**Ordnance Load:** Enter desired name of ordnance load

**Height of Burst:**

**Target Element:** Select target type from menu

**Alternate Target:**

**Timed Event:** TAKE\_OFF

**NEXT**

**Take-off Time:** Leave blank for immediate launch or DDHHMMZMMYY for desired launch time

**NEXT**

**Location:** Place mark on map display for location of attack

**Altitude:** Select altitude of flight

**Point Definition:** Select ATTACK

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

**TRANSMIT**

*c. Combat Air Patrol (CAP)*

Combat air patrol (CAP) is the seeking out of aircraft-on-aircraft engagements. In order to engage another aircraft in air-to-air combat, an AEW mission must be operating in the proximity and tracking the target. A hostile aircraft must have a track number, which is provided by the AEW aircraft, before it can be engaged. A contact's track number is located next to its symbol and mission name on the MTWS Tactical Display. Additionally, every contact detected by the AEW mission will appear in the Spot Report window along with its designated track number, when it is initially tracked by the AEW mission.

Performing the mission involves first defining a CAP mission, designating a hostile track to engage, and then vectoring the CAP mission to engage it. In addition, a Divert command is included in this section. If the hostile track is too far, MTWS will not allow a CAP mission to vector and engage it. The Divert command will allow the CAP mission to get in closer proximity so that a Vector command may be repeated.



(1) CAP Air Mission

COMMANDS>>AIR>>AIR\_MISSION>>DEFINE

**Frag Number:** Enter desired name for mission

**Aircraft Type ID:** Select squadron aircraft type

**Number of Aircraft:** Enter desired number of aircraft for mission

**Squadron ID:** Enter squadron name

**Take-off Point:** Enter name of originating airfield or carrier

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:**

NEXT

**Mission Type:** Select CAP

NEXT

**Ordnance Load:** Enter desired name of ordnance load

**Height of Burst:**

**Target Element:** Select AIRCRAFT

**Alternate Target:**

**Timed Event:** TAKE\_OFF

NEXT

**Take-off Time:** Leave blank for immediate launch or DDHHMMZMMMY for desired launch time

NEXT

**Location:**

**Altitude:** Select altitude of flight

**Point Definition:** Select ATTACK

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

TRANSMIT

(2) Hostile Track Designation

**COMMANDS>>AIR>>AIR\_TRACK>>DESIGNATE**

**Air Track ID:** Enter air track desired to be designated

**Track Designation:** Select HOSTILE

**Track Evaluation:** EVALUATED

**TRANSMIT**

(3) CAP Mission Vector

**COMMANDS>>AIR>>AIR\_MISSION>>VECTOR**

**Air Mission ID:** Enter name of air mission desired to be diverted to intercept/attack

**Track Number:** Enter track number of aircraft desiring to be attacked

**Ordnance Type:** If you desire to use a specific type of ordnance within the ordnance load, select choice.  
User can leave this field blank

**TRANSMIT**

(4) CAP Mission Divert

**COMMANDS>>AIR>>AIR\_MISSION>>DIVERT**

**Air Mission ID:** Enter name of air mission desired to be diverted

**NEXT**

**Location:** Place mark on map display for desired location to be diverted to

**Altitude:** Select desired altitude

**Point Definition:** Select ATTACK

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

**NEXT**

**Target Element:** Select AIRCRAFT

**TRANSMIT**

#### **E. CRUISE MISSILE OPERATIONS**

In MTWS cruise missiles cannot be launched by ships, rather they are accomplished with either B-1B or B-52 bombers. The instructions for this section will assume that the user has an operational airfield at which there is stationed a squadron of either B-1B or B-52 bombers. Additionally, a cruise missile ordnance load must be defined.

The instructions in this section will start with providing air launched cruise missiles (ALCM) to the squadron. Next a bomber air mission will be defined followed by a cruise missile air mission that will be associated to it. Finally, an AIR\_MISSION>>LAUNCH command will be given, to override the bomber mission's advanced launch time.

**a. Cruise Missile Allocation**

**COMMANDS>>CSS>>ASSET>>UPDATE**

**Unit or Cargo ID:** Enter name of B-1B squadron

**Asset Category:** Select ASSET

**NEXT**

**Asset Type:** Select ALCM from the Cruise Missiles category of menu\*

**Quantity of Asset:** Enter desired number of missiles for squadron

**Asset Damage Category:** Select OPERATIONAL

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

**TRANSMIT**

\*Do not select ALCM-MSL under the Ammo category in menu.

**b. Bomber Air Mission**

**COMMANDS>>AIR>>AIR\_MISSION>>DEFINE**

**Frag Number:** Enter desired name for mission

**Aircraft Type ID:** Select squadron aircraft type, either B-1B or B-52

**Number of Aircraft:** Enter desired number of aircraft for mission

**Squadron ID:** Enter squadron name

**Take-off Point:** Enter airfield name

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:**

**NEXT**

**Mission Type:** Select DAS

**NEXT**

**Ordnance Load:** Enter name of non-cruise missile ordnance load

**Height of Burst:**

**Target Element:** Select target type from menu

**Alternate Target:**

**Timed Event:** TAKE\_OFF

**NEXT**

**Take-off Time:** Enter time in DDHHMMZMMYY format. Recommend launch time must be 2 plus hours out\*

**NEXT**

**Location:** Place mark on map display for location of cruise missile launch

**Altitude:** Select altitude of flight

**Point Definition:** Select CM\_LAUNCH

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

**TRANSMIT**

\*A 2 plus hour launch time will allow time for fully entering in the mission. The launch command will activate it.

**c. Cruise Missile Air Mission**

**COMMANDS>>AIR>>AIR\_MISSION>>DEFINE**

**Frag Number:** Enter desired name for cruise missile mission

**Aircraft Type ID:** Select ALCM

**Number of Aircraft:** Enter desired number of aircraft for mission

**Squadron ID:** Enter squadron name

**Take-off Point:** Enter bomber mission name

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:**

**NEXT**

**Mission Type:** Select CM

**NEXT**

**Ordnance Load:** Enter name of cruise missile ordnance load

**Height of Burst:**

**Target Element:** Select target type from menu

**Alternate Target:**

**Timed Event:** TAKE\_OFF

**NEXT**

**Take-off Time:**

**NEXT**

**Location:** Place mark on map display for location of attack

**Altitude:** Select altitude of flight

**Point Definition:** Select ATTACK

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

**TRANSMIT**



**d. Air Mission Launch**

**COMMANDS>>AIR>>AIR\_MISSION>>LAUNCH**

**Air Mission ID:** Enter name of air mission being launched

**Launch Override:** NO

**TRANSMIT**

## **F. SHIP OPERATIONS**

Ship Operations will cover defining cruiser/destroyer type warships, performing basic ship operations as well as missile launches and gunfire support.

### **1. Ships**

Defining a ship is identical to defining an aircraft carrier found in the previous section, except you will select a different class of ship from the menu.

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired ship name

**Side Txt:** LF

**Unit Type:** Select SHIP

**NEXT**

**Hierarchy:** COMPANY

**Unit Location or Ship ID:** Place mark on map display for desired location of ship.

**Control Function:** Select desired Control Function

**Display Name:.**

**Real or Simulated:** SIMULATED

**NEXT**

**Lids Equipped:** FALSE

**TO/TE:** YES

**Service:** Select USN

**Ship sub-type:** Select desired ship class from either Ticonderoga class cruiser, Perry class frigate, or Burke or Spruance class destroyers. Refer to ship chart in Appendix B.

**TRANSMIT**

## 2. Harpoon Missile Launch

The Harpoon missile is an anti-ship missile and is not used against land-based targets or aircraft.

**COMMANDS>>FIRE SUPPORT>>FIRE\_MISSION>>DEFINE**

**Fire Mission ID:** Enter desired name of mission

**Fire Mission Type:** Options are: On\_Call-Mission that is later activated with FIRE\_ON\_CALL command  
SCHEDULED-Mission commences at designated DTG  
CALL\_FOR\_FIRE-Mission commences as soon as it is entered

**NEXT**

**Target:** Enter target name or place mark on map display at location of desired target

**Target Element:** Select SHIP

**Ordnance Type:** NON\_NUCLEAR

**NEXT**

**Firing Unit:** Enter name of ship firing missile

**Firing Weapon:** Select HARPOON-LNCHR

**Number of Weapons Positive Integer:** Enter 1

**Number of Rounds Per Unit Positive Integer:** Enter 1

**Projectile Type:** HARPOON-MSL

**Fuse Type:** Select NONE

**NEXT**

**Duration of Fire:**

**Supported Unit:**

**Priority Mission?:** Select YES

**FPF Mission?:** NO

**Mission Observed?:** Select YES

**NEXT**

**Fire Distribution:** CONVERGED

**TRANSMIT**

### 3. Naval Gunfire Mission

The gunfire support mission example will be an ON\_CALL mission and its activating FIRE\_ON\_CALL command.

#### a. On Call Fire Mission

COMMANDS>>FIRE SUPPORT>>FIRE\_MISSION>>DEFINE

**Fire Mission ID:** Enter desired name of mission

**Fire Mission Type:** Select ON\_CALL

NEXT

**Target:** Enter target name

**Target Element:** Select target type from menu

**Ordnance Type:** NON\_NUCLEAR

NEXT

**Firing Unit:** Enter name of ship firing gun

**Firing Weapon:** Select 5/54 NAV GUN

**Number of Weapons Positive Integer:** Enter 1

**Number of Rounds Per Unit Positive Integer:** Enter desired number of rounds

**Projectile Type:** Select SIN-HE

**Fuse Type:** Select D

NEXT

**Duration of Fire:**

**Supported Unit:**

**Priority Mission?:** Select YES

**FPF Mission?:** NO

**Mission Observed?:** Select YES

NEXT

**Fire Distribution:** CONVERGED

TRANSMIT

**b.     *Activating On Call Fire Mission***

**COMMANDS>>FIRE SUPPORT>>FIRE\_MISSION>>FIRE\_ON\_CALL**

**Fire Mission ID:** Enter name of ON\_CALL mission

**Time on Target:** Blank for immediate mission, otherwise enter start time in DDHHMMZMMMY format

**TRANSMIT**

**4.     *Activating Radar***

Activating a ship's radar is a two step process that first involves defining the radar field, then activating the radar.

**a.     *Radar Field Defined***

**COMMANDS>>INTELLIGENCE>>SEARCH\_RADAR>>DEFINE**

**Radar Field ID:** Enter desired name of radar field, recommend Ship Name + Radar, i.e., Tico Radar or DD985 Radar

**Radar Field Location:** Place mark on map display at location of ship

**Radar Type:** Select radar to activate \*

**Responsible Unit ID:** Enter ship name

**TRANSMIT**

\* Refer to ship radar compatibility chart in Appendix B

**b.     *Activating Radar***

**COMMANDS>>INTELLIGENCE>>SEARCH\_RADAR>>ACTIVATE**

**Radar Field ID:** Enter name previously used to define field, i.e., Tico Radar or DD985 Radar

**TRANSMIT**

## 5. Move Ship

**COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>MOVE**

**Movement Method:** Select BY\_SHIP or BY\_TASK\_FORCE, depending on situation

**NEXT**

**Ship ID:** Enter name of ship or task force, desired to be moved

**Attachments:** COLLOCATED

**Move Override:** YES

**Desired Speed (knots) Integer 1-50:** Enter desired speed

**Speed Override:** YES\*

**NEXT**

**Route Point:** Mark point on map that ship is to move to. By using the Iteration button instead of transmit, a route with up to 9 waypoints and 1 endpoint, can be created.

**Action Delay Time:** If desired to pause ship prior to executing command, enter time in DDHHHHZMMYY format

**NEXT**

or

**ITER**

\*Option will allow to enter a speed beyond which the ship class is capable

**Movement Start Time:** Enter time in DTG format when movement will start. Blank will move immediately

## 6. Ship Locate

Identical command to **COMMANDS>>GROUND>>UNIT>>LOCATE**, which can be used instead of the **SHIP\_OPERATIONS>>LOCATE** command.

**COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>LOCATE**

**Ship ID:** Name of ship to desired to be relocated

**New Ship Location:** Place mark on map display at point which ship is desired to be relocated to

**TRANSMIT**



## 7. Miscellaneous Ship Commands

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>HOLD**

Holds a ship or a task force for a specified amount of time. Will not be involved in operations until time expires or RESUME command utilized.

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>LOCATE**

Use to instantaneously relocate a ship. Command is identical to COMMANDS>>GROUND>>UNIT>>LOCATE command.

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>RESUME**

Overrides/ends a HOLD command.

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>REVERSE**

Reverses the movement of a ship or task force

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>SPEED**

Allows adjustment of speed for a ship or task force under a MOVE command.

### **COMMANDS>>SHIP OPS>>SHIP\_OPERATIONS>>STOP**

Stops a ship or task force under a move command.

## **G. AMPHIBIOUS OPERATIONS**

This section will cover defining an amphibious ship, setting launch hours, defining a landing site, and performing a landing with either aircraft or landing craft.

### **1. Amphibious Assault Ships**

Defining an amphibious assault ship is identical to defining an aircraft carrier. The full set of instructions will be duplicated in this section.

#### **a. Amphibious Assault Carrier**

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired ship name

**Side Txt:** LF

**Unit Type:** Select SHIP

**NEXT**

**Hierarchy:** COMPANY

**Unit Location or Ship ID:** Place mark on map for desired location of ship.

**Control Function:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**Lids Equipped:** FALSE

**TO/TE:** YES

**Service:** Select USN

**Ship sub type:** Select desired ship class, LHA or LHD for amphibious carriers or LSD for troop and equipment carrying capability. Refer to ship chart in Appendix A

**TRANSMIT**

**b. Amphibious Assault Carrier Airfield**

**COMMANDS>>AIR>>AIRFIELD>>DEFINE**

**Airfield ID:** Enter name of aircraft carrier

**Airfield Location:** Again, enter name of aircraft carrier

**Status:** OPEN

**Ordnance ID:**

**Fuel ID:**

**Air Squadrons ID(s):**

**NEXT**

**Runway ID(s):**

**Ownership:** MTWS OWNED

**TRANSMIT**

**c. Squadron**

**COMMANDS >> GROUND >> UNIT >> DEFINE**

**Unit ID:** Enter desired squadron name

**Side Txt:** LF

**Unit Type:** Select AIR SQUADRON

**NEXT**

**Hierarchy:** Select SQUADRON

**Unit Location or Ship ID:** Enter name of carrier or airbase that squadron will be stationed at

**Control Function:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**Use TO/TE:** YES

**NEXT**

**Service:** Select USMC \*

**Air Squadron Type:** Select desired type of squadron

**TRANSMIT**

\*No matter what type of aircraft or whether squadron will be based upon aircraft carrier, there will be less likelihood of Table of Organization type error if USMC is selected.

**d.     *Outfitting Amphibious Assault Helo Squadron***

**COMMANDS>>AIR>>AIRCRAFT>>DEFINE**

**Aircraft Type:** Select desired aircraft type from menu

**Squadron ID:** Enter desired name of squadron

**Mode 2 IFF:** Enter 4 digit number

**Definition Method:** Select QUANTITY\*

**NEXT**

**Number of Aircraft:** Enter desired number of aircraft type for squadron.

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

**TRANSMIT**

\*Choosing Quantity, MTWS will assign side numbers for each aircraft. Selecting Individual will result in the user assigning side numbers for each aircraft.

**e.     *Assault Ship/Airfield/Squadron Link***

**COMMANDS>>AIR>>AIRFIELD>>LINK**

**Airfield ID:** Enter airfield name

**Ordnance Unit ID:** Enter name of associated supply unit

**Fuel Unit ID:** Enter name of associated supply unit

**Air Squadron ID(s):** Enter name of associated squadron(s)\*

**Runway ID(s):**

**TRANSMIT**

\*If user has not yet defined associated squadron(s), then leave this field blank

## 2. Landing Beaches

The define a beach command is the establishment of a ship-to-shore landing zone.

### COMMANDS>>STS>>BEACH>>DEFINE

**Beach ID:** Enter desired name of beach

**Side:** LF

**Beach Endpoint:** Place mark on map at point where beach extends to

**Beach Endpoint:** Place mark on map at point opposite side, where beach extends from

NEXT

**Causeway Landside Endpoint:** Place mark on map display at land point where vehicle causeway will extend to\*

**Causeway Seaside Endpoint:** Place mark on map display at sea point where vehicle causeway will extend from\*

**LOD Endpoint:** Place mark on map display at line of departure, where vehicles start landward

**LOD Endpoint:** Place mark on map display at other end of line of departure

**Rendezvous Point:** Place mark on map display at point behind LOD where vehicles meet

NEXT

**Transport Area Definition Iter: 1(3-10):** Requires at least three points. Marks area where vehicles originate from. Place mark on map display for first point, then rotate clockwise marking other points for Transport Area. As you left click map display UTM coordinates will appear in Transport Area Definition input field. Note that a concave shaped Transport Area will result in an error.

**Underway Launch Line Endpoint:** Place mark on map display at one end of Underway Launch Line

**Underway Launch Line Endpoint:** Place mark on map display at other end of Underway Launch Line

**Beach Supply Area Unit ID:**

TRANSMIT

\*Causeways are optional



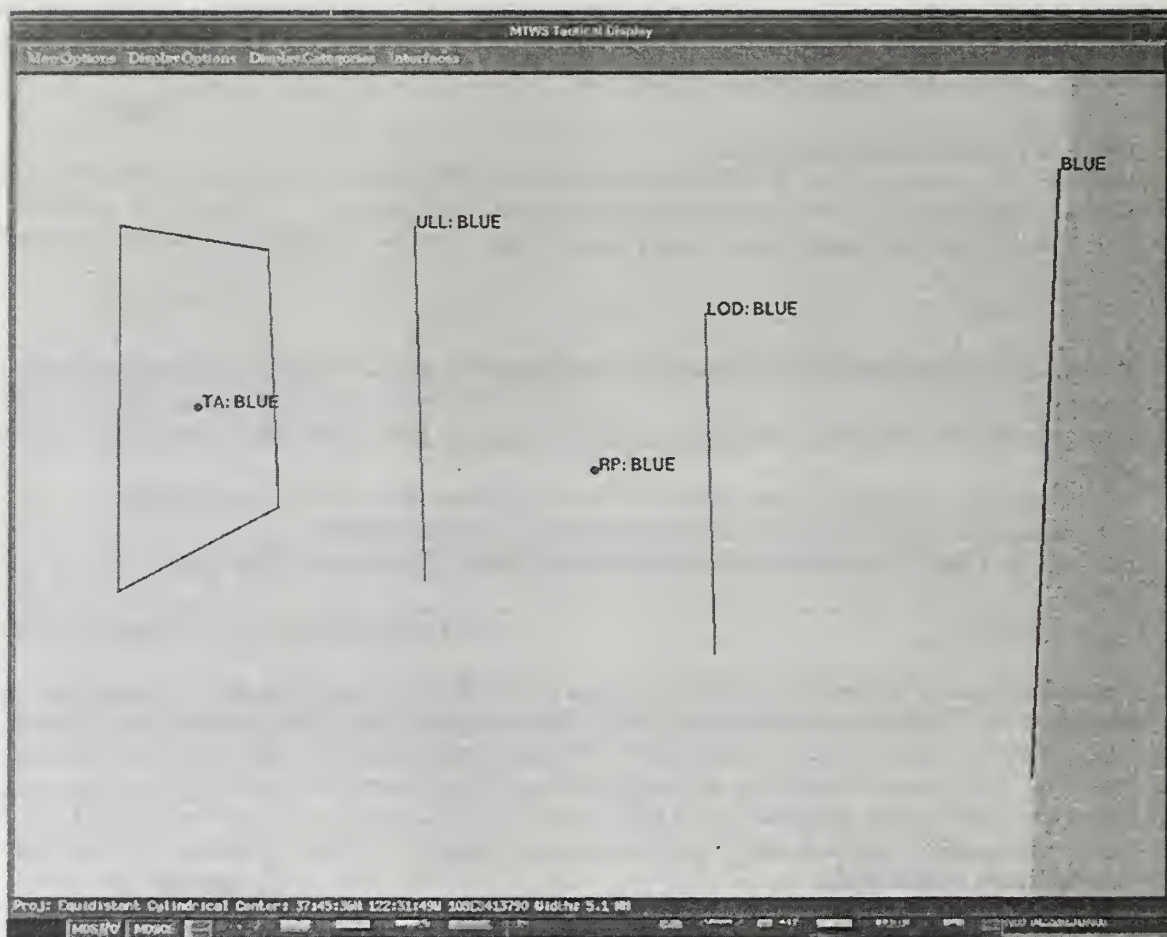


Figure 3. Defined Beach. Left to Right: Transport Area, Underway Launch Line, Rendezvous Point, Line of Departure, and Beach

### **3. Launch Hours**

The purpose of the launch hour command is to set a time at which different units could coordinate an attack. Utilizing this reference time, a ship-to-shore movement can be scheduled with all involved referenced to it. No other prompting or initiating is required

**COMMANDS >> STS >> A-Z\_HOUR >> DEFINE**

**A-Z Hour ID ("A" – "Z"):** Enter desired letter ID

**Corresponding Exercise Time:** Enter time movement is to commence, in DDHHMMZMMYY format

**TRANSMIT**

### **4. Landing Craft Ship-To-Shore Movement**

This section on ship-to-shore movement assumes that the user has a defined landing beach and has either located defined units or defined new units for the assault. Units desired to be utilized in the assault need to be located on the amphibious ship performing the mission. The actual ship-to-shore movement requires a serial that is associated with a wave. This section will cover allocating landing craft to the ship, defining a serial, then a wave. A landing hour is required as a time reference, but the user may elect to reference one then use the Landing Hour command

to establish one, after the assault is planned and defined into the simulation.

**a.     *Allocating Landing Craft***

COMMANDS>>CSS>>ASSETS>>UPDATE

**Unit or Cargo ID:** Enter name of ship that is being allocated landing craft

**Asset Category:** ASSET

NEXT

**Asset Type:** LCAC (or other craft) listed under LANDING CRAFT

**Quantity of Asset:** Recommend entering 2

**Asset Damage Category:** OPERATIONAL

**Rationale:** INITIAL

**Rationale Comment:** INITIAL

TRANSMIT

**b.     *Serial***

COMMANDS>>STS>>SERIAL>>DEFINE

**Serial ID:** Enter desired name for serial

**Side:** LF

**Ship ID:** Enter name of ship, assault is originating from

**Landing Method:** USE OF LANDING CRAFT

NEXT

**Cargo or Unit ID:** Enter name of unit that is being moved to the beach (assaulting beach)

**Destination Beach:** Enter name of previously defined assault beach

NEXT

**Landing Craft Type:** Select desired type for assault

**Number of Landing Craft:** Enter number desired for assault

TRANSMIT

### **c. Wave**

**COMMANDS>>STS>>WAVE>>DEFINE**

**Kind of Wave:** Select SCHEDULED

**Wave ID:** Enter desired name for assault movement

**Display Name:**

**Side:** LF

**Beach ID:** Enter name of previously defined assault beach

**Landing Time:** Enter landing hour +/- time for landing, i.e., B+00:30. B hour plus 30 minutes

**Serial ID(s):** Enter assault craft serials that have previously been defined

**Specify Landing Craft and Quantity?:** NO\*

**TRANSMIT**

\*Use this function for all landing craft to arrive at beach simultaneously

### **5. Aircraft Ship-To-Shore Movement**

Aircraft assaults differ from landing craft assaults in that they do not require a wave. Air assaults require a specified landing zone (check point), a serial, and an air mission. Finally the COMMANDS>>STS>>SERIAL>>ASSOCIATE is utilized to pair the air mission and the serial. A landing hour is required as a time reference, but the user may elect to reference one, then use the Landing Hour command to establish one after the assault is planned and defined into the simulation.

**a. Check Point**

**COMMANDS>>AIR>>CHECKPOINT>>DEFINE**

**Ground/Air Check Point ID:** Enter desired name for landing point

**Check Point Location:** Place mark on map display for location of landing point

**Side:** LF

**Is This a Landing Zone?:** YES

**TRANSMIT**

**b. Serial**

**COMMANDS>>STS>>SERIAL>>DEFINE**

**Serial ID:** Enter desired name for serial

**Side:** LF

**Ship ID:** Enter name of ship, assault is originating from

**Landing Method:** USE OF LANDING CRAFT

**NEXT**

**Cargo or Unit ID:** Enter name of unit that is being moved to the beach (assaulting beach)

**Destination Beach:** Enter name of previously defined assault beach

**NEXT**

**Landing Craft Type:** Select desired type for assault

**Number of Landing Craft:** Enter number desired for assault

**TRANSMIT**

**c. Air Assault Air Mission**

**COMMANDS>>AIR>>AIR\_MISSION>>DEFINE**

**Frag Number:** Enter desired name for assault mission  
**Aircraft Type ID:** Select squadron aircraft type  
**Number of Aircraft:** Enter desired number of aircraft for mission  
**Squadron ID:** Enter squadron name  
**Take-off Point:** Enter airfield name  
**Mode 1 IFF:**  
**Mode 3 IFF:**  
**Supported Unit:**

**NEXT**

**Mission Type:** Select STS

**NEXT**

**Timed Event:** TAKE\_OFF

**NEXT**

**Take-off Time:** Enter landing hour +/- time for landing, i.e., B+00:30. B hour plus 30 minutes

**NEXT**

**Location:** Enter name of designate Check Point  
**Altitude:** Select altitude of mission  
**Point Definition:** Select LAND  
**Ordnance Type:**  
**Ordnance Quantity:**  
**Units or Cargo:**

**TRANSMIT**

**d. Serial Associate**

**COMMANDS>>STS>>SERIAL>>ASSOCIATE**

**Serial ID:** Enter name of air assault serial previously defined  
**Air Mission ID:** Enter name of air assault mission previously defined

**TRANSMIT**



## 6. Miscellaneous STS Commands

### **COMMANDS>>STS>>ASSETS>>TRANSFER**

Allows transfer of assets from one unit or task force to another unit or task force, immediately.

### **COMMANDS>>STS>>ASSETS>>ABANDON**

Specified assets will "disappear" from system. They will no longer be a factor or be involved in exercise.

### **COMMANDS>>STS>>ASSETS>>UPDATE**

Increments or decrements assets of a unit or a cargo, instantly.

### **COMMANDS>>STS>>BEACH>>CHANGE\_LANDING\_TIME**

Changes landing time for a specified beach. All units involved in landing will implement change.

### **COMMANDS>>STS>>BEACH>>DELETE**

Deletes a specified beach

### **COMMANDS>>STS>>BEACH>>MODIFY**

Modifies attributes of a previously defined beach

## **H. GROUND OPERATIONS**

Ground troops and tank units are employed with the same commands in MTWS. Utilize the GROUND>>UNIT>>MISSION command and select the type of mission. Examples provided here will utilize ground troops in a movement and a tank unit in an attack. Action commands given to ground units, may sound similar but have different effects. Seize is a primary command and Attack is an override command. They will do similar actions, but Attack will have little concern for losses. Hold will override Defend and will have little concern for losses while holding onto a position.

**1. Ground Troops**

**a. Infantry Unit**

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired name of ground unit

**Side Txt:** LF

**Unit Type:** Select INFANTRY

**NEXT**

**Hierarchy:** Select desired size of unit

**Unit Location or Ship:** Place mark on map display for desired location of unit

**Control Function ID:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**USE TO/TE:** YES

**NEXT**

**Service/Alliance/Country:** Select USMC

**INFANTRY sub-type:** Select desired type of infantry unit

**TRANSMIT**

**b. Infantry Unit Move**

**COMMANDS>>GROUND>>UNIT>>MISSION**

**Unit ID:** Enter name of unit desired to be moved

**Mission:** Select MOVE

**Formation:** Select COLUMN

**Attachments:**

**Mission Type:** MV\_PLANS

**NEXT**

**Move Override:** YES

**Desired Speed:** Enter desired speed

**Speed Override:** Select yes if the speed desired is beyond a couple miles per hour

**Movement Start Time:** Leave blank for immediate start, otherwise enter start time in DDHHMMZMMMY format

**NEXT**

**Route Point Coordinate:** Place mark on map display for desired location of unit. Utilize the iteration function to create a route.

**Route Point Delay Time:** Enter time that unit is to wait before executing next route point.

**TRANSMIT**

or

**ITERATION**

## **2. Tanks**

### **a. Tank Unit**

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired name of tank unit

**Side Txt:** LF

**Unit Type:** Select TANK

**NEXT**

**Hierarchy:** Select desired size of unit

**Unit Location or Ship:** Place mark on map display for desired location of unit

**Control Function ID:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**USE TO/TE:** YES

**NEXT**

**Service/Alliance/Country:** Select USMC

**TANK sub-type:** Select M1A1

**TRANSMIT**

**b. Tank Seize Mission**

**COMMANDS>>GROUND>>UNIT>>MISSION**

**Unit ID:** Enter name of unit desired to be moved

**Mission:** Select SEIZE

**Formation:** Select LINE

**Attachments:**

**Mission Type:** MV\_PLANS

**NEXT**

**Move Override:** YES

**Desired Speed:** Enter desired speed

**Speed Override:** Select yes if the speed entered is beyond capabilities of the tank

**Movement Start Time:** Leave blank for immediate movement, otherwise enter start time in DDHHMMZMMYY format

**NEXT**

**Route Point Coordinate:** Place mark on map display for desired location of unit. Utilize the iteration function to create a route.

**Route Point Delay Time:** Enter time that unit is to wait before executing next route point.

**TRANSMIT**

or

**ITERATION**

\*Units will move abreast of each other



### 3. Fire Support

This section will provide guidance on establishing an artillery battery and performing fire support missions. Fire support missions from a battery are nearly identical to those performed from ships. Consult the naval gunfire section in this chapter for an example of an on-call mission.

#### a. Artillery Battery

COMMANDS>>GROUND>>UNIT>>DEFINE

Unit ID: Enter desired name of artillery unit

Side Txt: LF

Unit Type: Select ARTILLERY

NEXT

Hierarchy: Select desired size of unit

Unit Location or Ship: Place mark on map display for desired location of unit

Control Function ID: Select desired Control Function

Display Name:

Real or Simulated: Simulated

NEXT

LIDS Equipped: False

USE TO/TE: Yes

NEXT

Service/Alliance/Country: Select USMC

ARTILLERY sub-type: Select desired artillery battery\*

TRANSMIT

\* Current artillery batteries for USMC: 105-ARTY-HOW, 155MM-ARTY-HOW. U.S. Army utilizes: M-198, 155SP, and MLRS. If user utilizes Army batteries, select NO on TO/TE and utilize the ASSETS>>UPDATE command to furnish troops, artillery pieces, and ammo.

***b. Scheduled Fire Support Mission***

**COMMANDS>>FIRE SUPPORT>>FIRE\_MISSION>>DEFINE**

**Fire Mission ID:** Enter desired name of mission

**Fire Mission Type:** Select SCHEDULED

**NEXT**

**Target:** Enter target name or place mark on map display at target location

**Target Element:** Select target type from menu

**Ordnance Type:** NON\_NUCLEAR

**NEXT**

**Firing Unit:** Enter name of unit firing

**Firing Weapon:** Select artillery type (155MM-ARTY-HOW)

**Number of Weapons Positive Integer:** Enter 1

**Number of Rounds Per Unit Positive Integer:** Enter desired number of rounds

**Projectile Type:** Select ammunition type (155MM-HE)

**Fuse Type:** Select desired fuse type (D)

**NEXT**

**Duration of Fire:**

**Supported Unit:**

**Priority Mission?:** Select YES

**FPF Mission?:** NO

**Mission Observed?:** Select YES

**NEXT**

**Fire Distribution:** CONVERGED

**TRANSMIT**

### **c. Fire Support Quick Mission**

The fire support quick mission performs a fire support mission, with MTWS determining artillery pieces and ammunition to be utilized. This would be a factor if the battery possessed different artillery pieces and ammunition types.

**COMMANDS>>FIRE SUPPORT>>FIRE\_MISSION>>DEFINE\_QUICK\_MISSION**

**Fire Mission ID:** Enter desired name for artillery mission

**Target:** Enter target name or location

**Firing Unit:** Enter name of unit firing

**Projectile Type:** This is optional in a Quick Mission

**Supported Unit:**

**TRANSMIT**

### **4. Ground Unit Locate**

The ground unit locate command can be utilized to relocate any ground unit, and can be utilized on ships as well.

**COMMANDS>>GROUND>>UNIT>>LOCATE**

**Unit ID:** Enter name of unit desired to be relocated

**Unit Location:** Mark point on map display where unit is desired to be relocated to

**TRANSMIT**

## **I. COMBAT ENGINEERING**

Combat engineering functions are utilized to create and remove objects in the map display. This section will cover developing an engineering unit, creating and dismantling a minefield, creating a river in the display, and then building a bridge over it. If a combat engineering unit is not located close enough to perform a mission, then the GROUND>>UNIT>>LOCATE command can be utilized to place the unit in closer proximity to the project. An additional command will be the Force Completion command which will immediately complete any task that the combat engineers are involved in.

## 1. Combat Engineering Unit

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired name of ground unit

**Side Txt:** LF

**Unit Type:** Select INFANTRY

**NEXT**

**Hierarchy:** Select desired size of unit

**Unit Location or Ship:** Place mark on map display for desired location of unit

**Control Function ID:** Select desired Control Function

**Display Name:**

**Real or Simulated:** SIMULATED

**NEXT**

**LIDS Equipped:** FALSE

**USE TO/TE:** YES

**NEXT**

**Service/Alliance/Country:** Select USMC

**CE sub-type:** Select CMB\_ENG

**TRANSMIT**

## 2. Build A Minefield

**COMMANDS>>CE>>CE>>CONSTRUCT**

**CE Object ID:** Enter desired name of minefield

**Unit ID:** Enter name of unit constructing minefield

**Start Time:** Leave blank to start immediately, otherwise enter start time in DDHHMMZMMMY format

**CE Class Object:** Select OBSTACLE

**NEXT**

**Kind of Obstacle:** Select MINE

**NEXT**

**Side:** LF

**Kind of Minefield:** AH-MED is anti-helicopter medium density

AP-HIGH is anti-personnel high density

AS-LOW is anti-ship low density

AT is anti-tank

Mixed is a combination of land mines

**Area Coordinates:** Place marks on map display in a clockwise rotation. Ensure that shape is not concave.

**TRANSMIT**

## 3. Remove A Minefield

**COMMANDS>>CE>>CE>>REMOVE**

**CE Object ID:** Enter name of combat engineering constructed object, desired to be removed

**Unit ID:** Enter name of unit to remove object

**Start Time:** Leave blank to start immediately, otherwise enter time in DDHHMMZMMMY format

**TRANSMIT**



#### 4. Create A River

**COMMANDS>>CE>>CE>>CREATE**

**Object ID:** Name of object that is being created

**Object Class:** NATURAL\_TERRAIN

**NEXT**

**Kind of Feature:** RIVER

**NEXT**

**River Type:** RIVER

**Width in Meters:** Enter desired width of river

**Line Coordinates:** Place marks on map display for route that you desire river to take

**TRANSMIT**

#### 5. Bridge

**COMMANDS>>CE>>CE>>CONSTRUCT**

**CE Object ID:** Enter desired name of object that is being constructed

**Unit ID:** Enter name of CE unit that is constructing object

**Start Time:** Leave blank to start immediately, otherwise enter start time in DDHHMMZMMYY format

**NEXT**

**Improved Surface Kind:** Select Bridge

**NEXT**

**Bridge Type:** Select type of bridge desired

**Bridge Location:** Place mark on map display at point where bridge is desired

**Obstacle Being Bridged:** Enter name of obstacle\*

**TRANSMIT**

\*Ensure that obstacle name is entered and not type of obstacle.

## 6. Force Completion

**COMMANDS>>CE>>CE>>FORCE\_COMPLETION**

**CE Object ID:** Enter name of object that is desired to be completed immediately

**TRANSMIT**

## **J. MEDICAL EVACUATION**

This section will provide instruction on developing a hospital and performing an evacuation. An evacuation is complex, first involving developing a cargo of wounded, developing an air mission, then loading the cargo on the mission. For the example mission provided, the hospital will not be utilized, but rather the wounded will be returned to where the air mission originated.

### **1. Field Hospital**

**COMMANDS>>GROUND>>UNIT>>DEFINE**

**Unit ID:** Enter desired name of hospital unit

**Side Txt:** LF

**Unit Type:** Select MEDICAL

**NEXT**

**Hierarchy:** Company

**Unit Location:** Place mark on map display for desired location of hospital unit

**Control Function ID:** Select desired Control Function

**Display Name:**

**Real or Simulated:**

**NEXT**

**LIDS Equipped:** NO

**Use TO/TE:** Select NO\*

**TRANSMIT**

\*For this particular unit, it is recommended that user not utilize Table of Organization/Table of Equipment.

## **2. Medevac**

### **a. Medevac Cargo**

**COMMANDS>>CSS>>CARGO>>DEFINE**

**Cargo ID:** Enter desired name of cargo load

**Asset Category:** Select NO\_ASSET

**NEXT**

**Troops/No Troops:** Select TROOPS

**NEXT**

**Number of Troops Positive Integer:** Enter number of troops requiring medevac

**Troop Damage Category:** Select appropriate category from the menu, best describing condition of troops

**NEXT**

**Gallons of Fuel:**

**Gallons of Water:**

**Quantity of Rations:**

**Requesting Unit ID:** Enter the name of the unit where the troops are located/attached

**Supplying Unit ID:** Enter name of unit supplying medevac

**TRANSMIT**

**b.    Medevac Air Mission**

**COMMANDS>>AIR>>AIR\_MISSION>>DEFINE**

**Frag Number:** Enter desired name for mission

**Aircraft Type ID:** Select helicopter squadron aircraft type

**Number of Aircraft:** Enter desired number of aircraft for mission

**Squadron ID:** Enter squadron name

**Take-off Point:** Enter airfield name

**Mode 1 IFF:**

**Mode 3 IFF:**

**Supported Unit:**

**NEXT**

**Mission Type:** Select MEDEVAC

**NEXT**

**Timed Event:** TAKE\_OFF

**NEXT**

**Take-off Time:** Leave blank for immediate launch, otherwise enter time in DDHHMMZMMMY format.

**NEXT**

**Location:** Place mark on map display for location of medevac cargo

**Altitude:** Select altitude of mission

**Point Definition:** Select LAND

**Ordnance Type:**

**Ordnance Quantity:**

**Units or Cargo:**

**TRANSMIT**

**c. Load Patients Onto Medevac**

With this command the patients are loaded onto the helicopter and when they reach their ultimate station, they are unloaded automatically.

**COMMANDS>>CSS>>CARGO>>LOAD**

**Cargo ID:** Enter designated name of medevac load

**Unit or Air Mission ID:** Enter name of air mission assigned to pick up medevac load

**TRANSMIT**

**K. REPORTS**

MTWS has numerous predefined reports that cover all combat areas. This section will provide examples of two reports commonly utilized. The ordnance load report will provide the user with a listing of all defined ordnance loads as well as all types of ordnance that are contained within them. The ground unit asset report will list all assets associated with a unit.



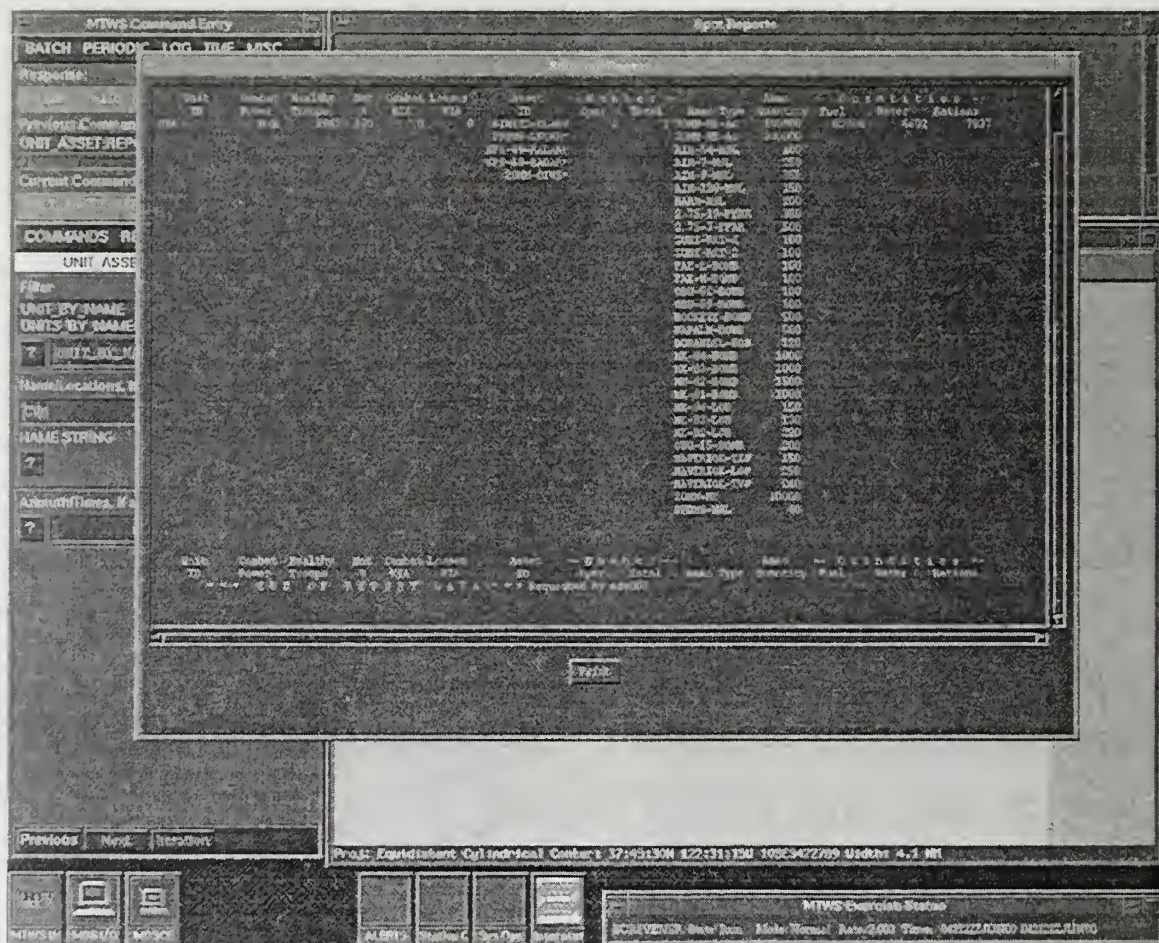


Figure 4. Expanded Reports Window.

## 1. DEFINED ORDNANCE LOADS REPORT

**REPORTS>>AIR>>ORDNANCE LOAD**

**Report ID:** AIR\_ORDLOAD\_DEFN\_RPT

**NEXT**

**Filter:** Select ORD\_LOAD\_ALL

**Name/Locations if applicable:**

**Azimuth/Times if applicable:**

**TRANSMIT**

## 2. UNIT ASSETS SUMMARY REPORT

**REPORTS>>GROUND>>UNIT ASSET**

**Report ID:** Select UNIT\_ASSETS\_SUM\_RPT

**NEXT**

**Filter:** Select UNIT\_BY\_NAME

**Name/Locations if applicable:** Enter name of desired unit for summary report

**TRANSMIT**

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# APPENDIX A: AIRCRAFT/ORDNANCE/FUSE COMPATIBILITY CHART

| AIRCRAFT<br>DESIGNATOR<br><br>NAME | COMPATIBLE<br>ORDNANCE | FUSE |   |    |    |    |    |      |
|------------------------------------|------------------------|------|---|----|----|----|----|------|
|                                    |                        | Q    | D | MT | VT | CP | DC | NONE |
| A-10A<br>ARDVARK                   | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                                    | NAPALM-BOMB            | X    |   |    |    |    |    |      |
|                                    | MK-81SE-BOMB           | X    | X | X  | X  |    | X  |      |
|                                    | MK-82SE-BOMB           | X    | X | X  | X  |    | X  |      |
|                                    | CBU-52-BOMB            |      |   | X  |    |    |    |      |
|                                    | CBU-59-BOMB            |      |   | X  |    |    |    |      |
|                                    | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                                    | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                                    | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                                    | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                                    | MK-82-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-83-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-84-LGB              | X    | X | X  | X  |    |    |      |
|                                    | 30MM-DU-AC             |      |   |    |    |    |    | X    |
|                                    | MAVERICK-IIR-MSL       | X    | X | X  | X  |    |    |      |
|                                    | MAVERICK-LG-MSL        | X    | X | X  | X  | X  | X  |      |
|                                    | MAVERICK-TV-MSL        | X    | X | X  | X  | X  | X  |      |

| AIRCRAFT<br>DESIGNATOR      | COMPATIBLE<br>ORDNANCE | FUSE |   |    |    |    |    |      |
|-----------------------------|------------------------|------|---|----|----|----|----|------|
|                             |                        | Q    | D | MT | VT | CP | DC | NONE |
| AV-8B<br>HARRIER            | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                             | NAPALM-BOMB            | X    |   |    |    |    |    |      |
|                             | MK-81SE-BOMB           | X    | X | X  | X  |    | X  |      |
|                             | MK-82SE-BOMB           | X    | X | X  | X  |    | X  |      |
|                             | CBU-52-BOMB            |      |   | X  |    |    |    |      |
|                             | CBU-59-BOMB            |      |   | X  |    |    |    |      |
|                             | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                             | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                             | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                             | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                             | ZUNI-RKT-2             | X    |   |    |    |    |    |      |
|                             | ZUNI-RKT-4             | X    |   |    |    |    |    |      |
|                             | 2.75-7-FFAR            | X    |   |    |    |    |    |      |
|                             | 2.75-19-FFAR           | X    |   |    |    |    |    |      |
|                             | 20MM-HE-AC             |      |   |    |    |    |    | X    |
|                             | MAVERICK-IIR-MSL       | X    | X | X  | X  |    |    |      |
|                             | MAVERICK-LG-MSL        | X    | X | X  | X  | X  | X  |      |
|                             | MAVERICK-TV-MSL        | X    | X | X  | X  | X  | X  |      |
| B-1B<br>LANCER              | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                             | ALCM-MSL               | X    | X | X  | X  | X  | X  |      |
| B-52<br>STRATO-<br>FORTRESS | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                             | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                             | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                             | ALCM-MSL               | X    | X | X  | X  | X  | X  |      |
| EA-6B<br>PROWLER            | HARM-MSL               | X    | X | X  | X  | X  | X  |      |
|                             | STD-ARM-MSL            | X    | X | X  | X  | X  | X  |      |
|                             | SHRIKE-MSL             | X    | X | X  | X  | X  | X  |      |
| F-14<br>TOMCAT              | AIM-54-MSL             |      |   |    |    |    |    | X    |
|                             | AIM-9-MSL              |      |   |    |    |    |    | X    |
|                             | AIM-7-MSL              |      |   |    |    |    |    | X    |



| AIRCRAFT<br>DESIGNATOR<br><br>NAME | COMPATIBLE<br>ORDNANCE | FUSE |   |    |    |    |    |      |
|------------------------------------|------------------------|------|---|----|----|----|----|------|
|                                    |                        | Q    | D | MT | VT | CP | DC | NONE |
| F-15<br>EAGLE                      | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                                    | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                                    | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                                    | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                                    | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                                    | MK-82-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-83-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-84-LGB              | X    | X | X  | X  |    |    |      |
|                                    | AIM-120-MSL            |      |   |    |    |    |    | X    |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |
|                                    | AIM-7-MSL              |      |   |    |    |    |    | X    |
| F-16<br>FALCON                     | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                                    | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                                    | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                                    | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                                    | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                                    | MK-82-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-83-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-84-LGB              | X    | X | X  | X  |    |    |      |
|                                    | HARM-MSL               | X    | X | X  | X  | X  | X  |      |
|                                    | STD-ARM-MSL            | X    | X | X  | X  | X  | X  |      |
|                                    | SHRIKE-MSL             | X    | X | X  | X  | X  | X  |      |
|                                    | AIM-120-MSL            |      |   |    |    |    |    | X    |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |



| AIRCRAFT<br>DESIGNATOR<br><br>NAME | COMPATIBLE<br>ORDNANCE | FUSE |   |    |    |    |    |      |
|------------------------------------|------------------------|------|---|----|----|----|----|------|
|                                    |                        | Q    | D | MT | VT | CP | DC | NONE |
| F-18<br>HORNET                     | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                                    | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                                    | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                                    | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                                    | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                                    | MK-82-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-83-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-84-LGB              | X    | X | X  | X  |    |    |      |
|                                    | NAPALM-BOMB            | X    |   |    |    |    |    |      |
|                                    | MAVERICK-IIR-MSL       | X    | X | X  | X  |    |    |      |
|                                    | MAVERICK-LG-MSL        | X    | X | X  | X  | X  | X  |      |
|                                    | MAVERICK-TV-MSL        | X    | X | X  | X  | X  | X  |      |
|                                    | WALLEYE-MSL            | X    | X | X  | X  | X  | X  |      |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |
| F-18D<br>HORNET                    | MK-81-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-82-BOMB             | X    | X | X  | X  |    | X  |      |
|                                    | MK-83-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-84-BOMB             | X    | X | X  | X  |    |    |      |
|                                    | MK-117-BOMB            | X    | X | X  | X  |    | X  |      |
|                                    | DURANDEL-BOMB          | X    | X |    |    |    |    |      |
|                                    | FAE-L-BOMB             |      |   | X  |    |    |    |      |
|                                    | FAE-H-BOMB             |      |   | X  |    |    |    |      |
|                                    | ROCKEYE-BOMB           |      |   | X  |    |    |    |      |
|                                    | MK-82-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-83-LGB              | X    | X | X  | X  |    |    |      |
|                                    | MK-84-LGB              | X    | X | X  | X  |    |    |      |
|                                    | NAPALM-BOMB            | X    |   |    |    |    |    |      |
|                                    | MAVERICK-IIR-MSL       | X    | X | X  | X  |    |    |      |
|                                    | MAVERICK-LG-MSL        | X    | X | X  | X  | X  | X  |      |
|                                    | MAVERICK-TV-MSL        | X    | X | X  | X  | X  | X  |      |
|                                    | WALLEYE-MSL            | X    | X | X  | X  | X  | X  |      |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |
| P-3<br>ORION                       | BULLPUP-MSL            | X    | X | X  | X  | X  | X  |      |

| AIRCRAFT<br>DESIGNATOR<br><br>NAME | COMPATIBLE<br>ORDNANCE | FUSE |   |    |    |    |    |      |
|------------------------------------|------------------------|------|---|----|----|----|----|------|
|                                    |                        | Q    | D | MT | VT | CP | DC | NONE |
| AH-1W<br>COBRA                     | HELLFIRE-MSL           | X    | X | X  | X  | X  | X  |      |
|                                    | TOW-MSL                |      |   |    |    |    |    | X    |
|                                    | ZUNI-RKT-2             | X    |   |    |    |    |    |      |
|                                    | ZUNI-RKT-4             | X    |   |    |    |    |    |      |
|                                    | 2.75-7-FFAR            | X    |   |    |    |    |    |      |
|                                    | 2.75-19-FFAR           | X    |   |    |    |    |    |      |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |
|                                    | 20MM-HE-AC             |      |   |    |    |    |    | X    |
| AH-64A<br>APACHE                   | HELLFIRE-MSL           | X    | X | X  | X  | X  | X  |      |
|                                    | ZUNI-RKT-2             | X    |   |    |    |    |    |      |
|                                    | ZUNI-RKT-4             | X    |   |    |    |    |    |      |
|                                    | 2.75-7-FFAR            | X    |   |    |    |    |    |      |
|                                    | 2.75-19-FFAR           | X    |   |    |    |    |    |      |
|                                    | AIM-9-MSL              |      |   |    |    |    |    | X    |
|                                    | 20MM-HE-AC             |      |   |    |    |    |    | X    |
| UH-60<br>BLACKHAWK<br>SEA HAWK     | ZUNI-RKT-2             | X    |   |    |    |    |    |      |
|                                    | ZUNI-RKT-4             | X    |   |    |    |    |    |      |
|                                    | 2.75-7-FFAR            | X    |   |    |    |    |    |      |
|                                    | 2.75-19-FFAR           | X    |   |    |    |    |    |      |

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## APPENDIX B: SHIP WEAPONS SYSTEMS AND RADAR CHART

| PLATFORM NAME<br>AS DISPLAYED IN<br>MENU | PLATFORM<br>TYPE               | PLATFORM<br>DESIGNATOR | PLATFORM<br>WEAPON<br>SYSTEMS                            | PLATFORM<br>RADARS           |
|------------------------------------------|--------------------------------|------------------------|----------------------------------------------------------|------------------------------|
| BLUE RIDGE<br>LCC                        | COMMAND<br>SHIP                | LCC                    | 20MM CIWS<br>BPDMS LNCHR                                 | SPS-48 RADAR<br>SPS-40 RADAR |
| ARLIEGH BURKE<br>BURKE_CLASS             | DESTROYER                      | DDG                    | 20MM CIWS<br>HARPOON LNCHR<br>STD-SM-2 LNCHR             | SPY-1D RADAR                 |
| KIDD<br>KIDD_CLASS                       | DESTROYER                      | DD                     | 20MM CIWS<br>5/54 GUN<br>HARPOON LNCHR<br>STD-SM-2 LNCHR | SPS-48 RADAR                 |
| JOHN F. KENNEDY<br>JFK_CLASS             | AIRCRAFT<br>CARRIER            | CV                     | 20MM CIWS                                                | SPS-48 RADAR<br>SPS-49 RADAR |
| LOS ANGELES                              | SUBMARINE                      | SSN                    | HARPOON LNCHR                                            |                              |
| NIMITZ<br>NIMITZ_CLASS                   | NUCLEAR<br>AIRCRAFT<br>CARRIER | CVN                    | 20MM CIWS                                                | SPS-48 RADAR<br>SPS-49 RADAR |
| OLIVER HAZARD<br>PERRY<br>PERRY_CLASS    | FRIGATE                        | FFG                    | 20MM CIWS<br>STD-SM-2 LNCHR                              | SPS-49 RADAR                 |
| SEAWOLF                                  | SUBMARINE                      | SSN                    | HARPOON LNCHR                                            |                              |
| SPRUANCE<br>SPRUANCE_CLASS               | DESTROYER                      | DD                     | 20MM CIWS<br>5/54 GUN<br>HARPOON LNCHR<br>STD-SM-2 LNCHR | SPS-40 RADAR                 |

|                           |                                       |     |                                                          |                              |
|---------------------------|---------------------------------------|-----|----------------------------------------------------------|------------------------------|
| TAWARA<br>LHA             | AMPHIBIOUS<br>ASSAULT<br>CARRIER      | LHA | 20MM CIWS<br>5/54 GUN<br>BPDMS LNCHR                     | SPS-40 RADAR<br>SPS-52 RADAR |
| TICONDEROGA<br>TICO_CLASS | CRUISER                               | CG  | 20MM CIWS<br>5/54 GUN<br>HARPOON LNCHR<br>STD-SM-2 LNCHR | SPY-1B RADAR                 |
| WASP<br>LHD               | AMPHIBIOUS<br>ASSAULT<br>CARRIER      | LHD | 20MM CIWS                                                | SPS-48 RADAR<br>SPS-52 RADAR |
| WHIDBEY ISLAND<br>LSD     | AMPHIBIOUS<br>DOCK<br>LANDING<br>SHIP | LSD |                                                          | SPS-49 RADAR                 |

# APPENDIX C: MTWS SYMBOLOGY



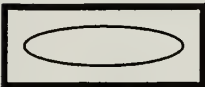
Light Air  
Defense/  
Air Traffic  
Control



Engineering



Communications



Tank  
Motorized



Motorized  
Reconnaissance



Motorized  
Infantry



Mortar



Artillery



Assault  
Gun



Anti-Tank



Reconnaissance



Aviation



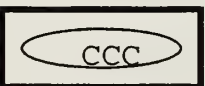
Infantry



Military  
Police



Medical



Amphibian  
Assault



Anti-Aircraft  
Battery



Mobil Anti-  
Aircraft





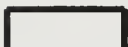
Unknown  
Surface  
Track



Friendly  
Surface  
Track



Hostile  
Surface  
Track



Unknown  
Air Track



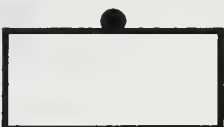
Friendly  
Air Track



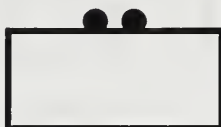
Hostile  
Air Track



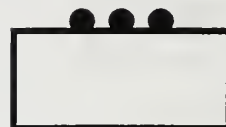
Ship



Squad



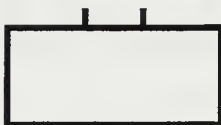
Section



Platoon



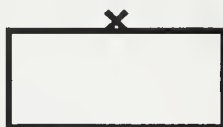
Company/  
Battery



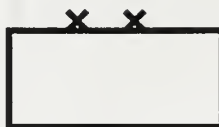
Battalion/  
Squadron



Regiment/  
Air Group



Brigade



Division/  
Air Wing

## APPENDIX D: BRINGING MTWS NETWORK UP

### Starting MTWS System Control (MSC)

1. Enter user name.
2. Enter password.  
  
System Control icon will appear.
3. Right click: Start Sysop>>MTWS.  
  
Alerts, MTWS System Control, and Status for Exercise windows will appear.
4. In MTWS System Operations window: System Control>>Admin>>Start>>MSC.  
  
Click OK.  
  
Command Valid: MSC Started will appear.
5. In MTWS System Operations window: System Control>>Applications>>Load  
  
MAN.  
  
Select desired MANs.  
  
Click OK.  
  
Valid Command: APP\_LOAD\_MAN will appear.
6. In MTWS System Operations window: Exercise  
  
Control>>Database>>Exercise>>Load.  
  
Select desired exercise.  
  
Click OK.  
  
Click OK.

7. In MTWS System Operations window: System Control>>Applications>>Start App.  
Click OK>  
Valid Command: APP\_START will appear
8. In MTWS System Operations window: System Control>>Interfaces>>MDS\_Net>>Start.  
Valid Command: Interface is Started MSC\_MDS will appear.
9. In MTWS System Operations window: Exercise Control>>Operation>>State>>Run.  
Valid Command: STATE\_RUN will appear.

#### **Starting MTWS Display Station (MDS)**

1. Enter user name.
2. Enter password.  
MTWS User icon will appear.
3. Right click mouse: MTWS>>Start MDS>>Without CBT.
4. Double click Station Control icon.
5. Select User Privilege Level 2.
6. Enter User Privilege Level 2 password.
7. Select On Line.

## **GLOSSARY OF MTWS-RELATED ABBREVIATIONS AND ACRONYMS**

|           |                                                      |
|-----------|------------------------------------------------------|
| A-Z Hours | Supporting Arms Reference Times                      |
| AA        | Air-to-Air, Amphibious Assault                       |
| AAA       | Anti-Air Artillery                                   |
| AAM       | Air-To-Air Missile                                   |
| AARM      | Anti-Air Radiation Missile                           |
| AAS       | Air-to-Surface                                       |
| AAV       | Assault Amphibious Vehicle                           |
| AAW       | Air-to-Air Weapon                                    |
| AC        | Chemical Agent Hydrogen Cyanide, Aircraft, Air Cover |
| ACA       | Airspace Coordination Area                           |
| ACE       | Air Combat Element                                   |
| AD        | Air Defense                                          |
| ADZ       | Air Defense Zone                                     |
| AEW       | Airborne Early Warning                               |
| AG        | Aggressor                                            |
| AGAIR     | Aggressor Air Control                                |
| AGARTY    | Aggressor Artillery Control                          |
| AGCON     | Aggressor Control                                    |
| Aggressor | Enemy Force                                          |

|             |                                                          |
|-------------|----------------------------------------------------------|
| AGL         | Above Ground Level                                       |
| AIM         | Air Intercept Missile                                    |
| AIRCON      | Air Control                                              |
| AIRDEF      | Air Defense Control                                      |
| AIZ         | Air Intercept Zone                                       |
| ALCM        | Air Launched Cruise Missile                              |
| ALSM        | Air Launched Surface Missile                             |
| Ammo        | Ammunition                                               |
| AN          | Alphanumeric                                             |
| AO          | Air Operations                                           |
| AOA         | Amphibious Operations Area                               |
| AOAD        | Air Operations Air Defense constituent capability        |
| AOAM        | Air Operations Air Mission constituent capability        |
| AOAR        | Air Operations Air Reconnaissance constituent capability |
| AOC         | Air Operations Command                                   |
| AOCF        | Air Operations Command Function                          |
| AOEW        | Air Operations Electronic Warfare                        |
| AP          | Air Processing; or Anti-Personnel                        |
| ARM         | Anti-Radiation Missile                                   |
| Armed Recce | Armed Air Reconnaissance                                 |
| ARTY        | Artillery                                                |
| ARTYCON     | Artillery Control                                        |

|           |                                                              |
|-----------|--------------------------------------------------------------|
| AS        | Air-to-Surface                                               |
| ASAP      | As Soon As Possible                                          |
| ASM       | Air-to-Surface Missile                                       |
| ASQ       | Air Squadron                                                 |
| AT        | Anti-Tank                                                    |
| ATF       | Amphibious Task Force                                        |
| ATGM      | Anti-Tank Guided Missile                                     |
| ATK       | Anti-Tank                                                    |
| ATO       | Air Tasking Order                                            |
| AWACS     | Airborne-Warning and Control System                          |
| AWC       | Actual Water Consumption                                     |
| A-Z Hours | Supporting Arms Reference Times                              |
| BDA       | Battle-Damage Assessment                                     |
| Bde       | Brigade                                                      |
| BL        | Boundary Line                                                |
| Bn        | Battalion                                                    |
| BSA       | Beach Support Area                                           |
| Btry      | Battery                                                      |
| BWC       | Basic Water Consumption                                      |
| C4I       | Command, Control, Communications, Computers and Intelligence |
| CA        | Casualty and Damage Assessment                               |
| CAAT      | Area Target CA                                               |



|        |                                  |
|--------|----------------------------------|
| CACF   | CA Command Function              |
| CAL    | Caliber                          |
| CAMF   | Minefield CA                     |
| CANO   | Non Battle CA                    |
| CAOB   | Barrier or Obstacle CA           |
| CAP    | Combat Air Patrol                |
| CAPT   | Point Target CA                  |
| CAS    | Close Air Support                |
| CASLIM | Casualty Limit                   |
| CASW   | Special Weapons CA               |
| CATF   | Commander, Amphibious Task Force |
| CBU    | Cluster Bomb Unit                |
| C2     | Command and Control              |
| CC     | Close Combat or Clock Control    |
| CDA    | Casualty Damage Assessment       |
| CE     | Combat Engineer(s)(ing)          |
| CECF   | CE Command Function              |
| CECON  | Combat Engineer Control          |
| CF     | Command Function                 |
| CFE    | Combined Features and Elevation  |
| CFL    | Coordinated Fire Line            |
| CFR    | Counter Fire Radar               |

|         |                                                    |
|---------|----------------------------------------------------|
| CG      | Carrier Group                                      |
| CIFS    | Close-In Fire Support                              |
| CIV     | Civilian                                           |
| Class   | The general group that a widget belongs to.        |
| CLGP    | Cannon Launched Guided Projectiles                 |
| CM      | Cruise Missile                                     |
| Cmd     | Command                                            |
| COLO    | Collocated                                         |
| COM     | Communications                                     |
| Configs | Configurations                                     |
| COZ     | Crossover Zone                                     |
| CP      | Command Post or Concrete-Piercing or Control Point |
| Cpl     | Corporal                                           |
| CSS     | Combat Service Support                             |
| CSSCON  | Logistics Control                                  |
| CSSET   | Equipment Evacuation Teams                         |
| CSSME   | Medical Evacuation CSS Teams                       |
| CSSRP   | Resupply/Personnel Replacement                     |
| CSSRT   | Equipment Repair CSS Team                          |
| Ctl     | Control                                            |
| CTRL    | Control                                            |
| CV      | Conventional Powered Aircraft Carrier              |

|        |                                                                 |
|--------|-----------------------------------------------------------------|
| CVN    | Nuclear Powered Aircraft Carrier                                |
| CVTF   | Aircraft Carrier Task Force                                     |
| CW     | Communications and Electronic Warfare or "Causeway"             |
| DAS    | Deep Air Support                                                |
| DIV    | Division                                                        |
| DMZ    | De-Militarized Zone                                             |
| DP     | Drop Point                                                      |
| DTED   | Digital Terrain and Elevation Data                              |
| DTG    | Date-Time Group                                                 |
| DUI    | Data Unique Identifier                                          |
| EC     | Exercise Control                                                |
| ECCM   | Electronic Counter-Countermeasures                              |
| ECM    | Electronic Countermeasures                                      |
| ENG    | Engineering                                                     |
| Enr    | Enroute                                                         |
| ENV    | Environment                                                     |
| ESM    | Electronic Support Measures or Electronic Surveillance Measures |
| ETS    | Effective Troop Strength                                        |
| EW     | Electronic Warfare                                              |
| EZ     | Engagement Zone                                                 |
| F-Kill | Firepower Kill                                                  |
| FAC    | Forward Air Controller                                          |

|          |                                            |
|----------|--------------------------------------------|
| FARP     | Forward Arming and Refueling Point         |
| FASCAM   | Family of Scatterable mines                |
| FASCAMAT | Scatterable mines, anti-tank               |
| FEBA     | Forward Edge of the Battle Area            |
| FFA      | Free Fire Area                             |
| FFE      | Fire for Effect                            |
| FIFO     | First In, First Out                        |
| Flids    | Light Intensification Device Factor        |
| FLT      | Flight                                     |
| FM       | Fire Mission                               |
| FMC      | Field Maneuver Controller                  |
| FMF      | Fleet Marine Force                         |
| FMFLANT  | Fleet Marine Force Atlantic                |
| FMFM     | Fleet Marine Force Manual                  |
| FMFPAC   | Fleet Marine Force Pacific                 |
| FO       | Forward Observer                           |
| FPF      | Final Protective Fire                      |
| FRAG     | Fragmentary Order                          |
| FRDCP    | Formation and Range-Dependent Combat Power |
| FROG     | Free Rocket Over Ground                    |
| FS       | Fire Support                               |
| FSA      | Fire Support Area                          |

|        |                                                     |
|--------|-----------------------------------------------------|
| FSCF   | Fire Support Command Function                       |
| FSCL   | Fire Support Coordination Line                      |
| FSSG   | Force Service Support Group                         |
| FT     | Foot Trafficability                                 |
| Gal    | Gallon                                              |
| GB     | chemical nerve agent Sarine                         |
| GC     | Ground Combat                                       |
| GCCF   | Ground Combat Command Function                      |
| GCCS   | Global Command and Control System                   |
| GCI    | Ground Controlled Intercept(s)                      |
| GD     | Designation for the chemical nerve agent Soman      |
| GES    | Ground Emplaced Sensor                              |
| GID    | Group Identification                                |
| GLCM   | Ground Launched Cruise Missile                      |
| GM     | Ground Movement                                     |
| GND    | Ground                                              |
| GPS    | Global Positioning System                           |
| Grd    | Ground                                              |
| GSR    | Ground Surveillance Radar                           |
| H-Hour | Planned time of arrival of surface assault elements |
| H&S    | Headquarters and Support                            |
| HARM   | High Speed Anti-Radiation Missile                   |

|       |                                                                       |
|-------|-----------------------------------------------------------------------|
| HAW   | Heavy Antitank Weapon                                                 |
| HD    | Designation of a chemical blister agent                               |
| HE    | High Explosive                                                        |
| HELO  | Air Helicopter Control                                                |
| HF    | High Frequency                                                        |
| HL    | Designation of a chemical blister which is a Mustard-Lewisite mixture |
| HLZ   | Helicopter Landing Zone                                               |
| HMMWV | High Mobility Motorized Wheeled Vehicle                               |
| HOB   | Height of Burst                                                       |
| HOW   | Howitzer                                                              |
| HQ    | Headquarters                                                          |
| Hr    | Hour                                                                  |
| HST   | Helicopter Support Team                                               |
| ICM   | Improved Conventional Munitions                                       |
| ICMDP | Improved Conventional Munitions, Dual Purpose                         |
| ID    | Identification or Identifier                                          |
| IFF   | Identification Friend or Foe                                          |
| IFR   | In Flight Refueling                                                   |
| IFY   | Infantry                                                              |
| ILLUM | Illumination                                                          |
| IN    | Intelligence                                                          |
| INCON | Intelligence Control                                                  |



|         |                                           |
|---------|-------------------------------------------|
| INF     | Infantry                                  |
| Info    | Information                               |
| I/O     | Input/Output                              |
| Init    | Initialize                                |
| Intel   | Intelligence                              |
| IR      | Infrared                                  |
| JMCIS   | Joint Maritime Command Information System |
| JOG     | Joint Operations Graphic (Map Format)     |
| JP      | Jet Propelled                             |
| KB      | Kilobytes                                 |
| Kbytes  | Kilobytes                                 |
| K-Kill  | Catastrophic Kill                         |
| KBPS    | Kilobytes Per Second                      |
| KIA     | Killed in Action                          |
| Km      | Kilometer                                 |
| Kph     | kilometers Per Hour                       |
| Kt      | Knot (nautical miles per hour)            |
| KT      | Kiloton                                   |
| LA      | Light Armored                             |
| LAAD    | Light Anti-Air Defense                    |
| LAAM    | Light Anti-Air Missile                    |
| Lat/Lon | Latitude/Longitude                        |

|        |                                                  |
|--------|--------------------------------------------------|
| LAV    | Light Assault Vehicle                            |
| LAW    | Light Antitank Weapon                            |
| Lb     | Pound                                            |
| LC     | Landing Craft                                    |
| LCAC   | Landing Craft Air Cushion                        |
| LCpl   | Lance Corporal                                   |
| LED    | Light-Emitting Diode                             |
| LF     | Landing Force                                    |
| LG     | Laser-Guided                                     |
| LHA    | Helicopter/VSTOL-capable amphibious assault ship |
| LIDS   | Light Intensification Devices                    |
| LMG    | Light Machine Gun                                |
| LOD    | Line of Departure                                |
| LOGCON | Logistics Control                                |
| LOS    | Line-of-Sight                                    |
| LPD    | Landing Platform Dock                            |
| LPH    | Landing Platform Helicopter                      |
| LSD    | Landing Ship, Dock                               |
| LST    | Landing Ship Tank                                |
| LtCol  | Lieutenant Colonel                               |
| LZ     | Landing Zone                                     |
| M      | Meter                                            |

|          |                                           |
|----------|-------------------------------------------|
| M-Kill   | Mobility Kill                             |
| MADR     | Maximum aural detection range             |
| MAE      | Mean Area of Effectiveness                |
| MAG      | Marine Air Group                          |
| MAGTF    | Marine Air Ground Task Force              |
| MAINT    | Maintenance                               |
| MAJ      | Major                                     |
| MAN      | MTWS Application Network                  |
| MAN-COMM | Man Communications                        |
| MANCON   | Maneuver Control                          |
| MAW      | Marine Air Wing or Medium Antitank Weapon |
| Mbps     | Megabit Per Second                        |
| Mbytes   | Megabytes                                 |
| MCAS     | Marine Corps Air Station                  |
| MDS      | MTWS Display System                       |
| MEB      | Marine Expeditionary Brigade              |
| MED      | Medical                                   |
| MEDEVAC  | Medical Evacuation                        |
| MEF      | Marine Expeditionary Force                |
| MEU      | Marine Expeditionary Unit                 |
| MF       | Mine Field                                |
| Mgmt     | Management                                |

|         |                                                                  |
|---------|------------------------------------------------------------------|
| MHz     | MegaHertz                                                        |
| Mi      | Mile                                                             |
| Mil     | Military                                                         |
| MIZ     | Missile Intercept Zone                                           |
| MM      | Millimeter                                                       |
| MOGAS   | Motor Gasoline                                                   |
| MOPP    | Mission Oriented Protective Posture                              |
| MORTCON | Mortar Control                                                   |
| MOV     | Movement                                                         |
| MRL     | Multiple Rocket Launcher                                         |
| MRLS    | Multiple Rocket Launcher System                                  |
| MSC     | MTWS System Control                                              |
| Msg     | Message                                                          |
| MSL     | Mean Sea Level or Missile                                        |
| MSLS    | Missiles                                                         |
| Msn     | Mission                                                          |
| MT      | Motorized Transport                                              |
| MTI     | Moving Target Indicator                                          |
| MTR     | Mortar                                                           |
| MTTR    | Mean Time To Repair                                              |
| MTS     | Marine Tactical Systems                                          |
| MTWS    | Marine Air Ground Task Force (MAGTF) Tactical Warfare Simulation |

|         |                                                      |
|---------|------------------------------------------------------|
| MV      | Movement                                             |
| MWSG    | Marine Wing Support Group                            |
| NB      | Nuclear, Biological, and Chemical Warfare Capability |
| NBC     | Nuclear/Biological/Chemical                          |
| NFA     | No Fire Area                                         |
| NFL     | No Fire Line                                         |
| NGF     | Naval Gun Fire                                       |
| NGFCON  | Naval Gunfire Control                                |
| NIMA    | National Imagery and Mapping Agency                  |
| NM      | Nautical Miles                                       |
| NTCS    | Naval Tactical Command System                        |
| NTDS    | Naval Tactical Data System                           |
| NUC     | Nuclear                                              |
| OL      | Ordnance Load                                        |
| ONC     | Operational Navigational Chart                       |
| OPFOR   | Opposing Force (Aggressor)                           |
| Ops     | Operations                                           |
| ORD     | Ordnance                                             |
| ORDLOAD | Air Ordnance Load                                    |
| OTH     | Over The Horizon                                     |
| PLRS    | Position Location Reporting System                   |
| POW     | Prisoner of War                                      |

|       |                                          |
|-------|------------------------------------------|
| PU    | Pick-Up Point                            |
| RAD   | Radiation Absorbed Dose or “Radioactive” |
| RAO   | Reconnaissance Area of Operation         |
| RAP   | Radar-Assisted Projectile                |
| RDF   | Radio Direction Finding                  |
| RECCE | Reconnaissance                           |
| RECON | Reconnaissance                           |
| Rein  | Reinforced                               |
| Req   | Requirement                              |
| RFA   | Restricted Fire Area                     |
| RFL   | Restricted Fire Line                     |
| RGB   | Red-Green-Blue                           |
| RI    | Radio Intercept                          |
| RLT   | Regimental Landing Team                  |
| RP    | Rendezvous Point                         |
| RPG   | Rocket-Propelled Grenade                 |
| RPV   | Remotely Piloted Vehicle                 |
| RT    | Real Time                                |
| RTB   | Return to Base                           |
| SA    | Surface-to-Air                           |
| SAC   | Service, Alliance or Country             |
| SAM   | Surface-to-Air Missile                   |



|           |                                         |
|-----------|-----------------------------------------|
| SAW       | Squad Automatic Weapon                  |
| SG        | Strike Group                            |
| Sgt       | Sergeant                                |
| SIGINT    | Signals Intelligence                    |
| SLAR      | Side-Looking Airborne Radar             |
| SLBM      | Sea Launched Ballistic Missile          |
| SLCM      | Sea Launched Cruise Missile             |
| SMAW      | Shoulder-Mounted Assault Weapon         |
| SNCO      | Staff Non-Commissioned Officer          |
| SNI       | Soviet Naval Infantry                   |
| SOC       | System Operator Console or Control      |
| SPAWAR    | Space and Naval Warfare Systems Command |
| Spec      | Specification                           |
| Spotrpt   | Spot Report                             |
| Squawk(s) | IFF settings                            |
| SS        | Surface-to-Surface                      |
| SSM       | Surface-to-Surface Missile              |
| Std       | Standard                                |
| STS       | Ship-To-Shore                           |
| STSCON    | Ship-To-Shore Control                   |
| SUP       | Supply                                  |
| TA        | Transport Area                          |

|        |                                                                            |
|--------|----------------------------------------------------------------------------|
| TAC    | Tactical Air Controller                                                    |
| TACAN  | Tactical Air Navigation                                                    |
| TACP   | Tactical Air Control Party                                                 |
| TBD    | To Be Determined                                                           |
| TD     | Terrain                                                                    |
| TF     | Task Force                                                                 |
| TK     | Tank                                                                       |
| TLAM-N | Tactical Land Attack Cruise Missile with a Nuclear Warhead                 |
| Tnk    | Tank                                                                       |
| TOT    | Time or Target                                                             |
| TO/TE  | Table of Organization/Table of Equipment                                   |
| TOW    | Tube Launched, Optically Tracked, Wire Command Link, Guided Missile System |
| TPT    | Transport                                                                  |
| UHF    | Ultra High Frequency                                                       |
| UMV    | Unit Movement                                                              |
| US     | United States                                                              |
| USA    | United States Army                                                         |
| USAF   | United States Air Force                                                    |
| USMC   | United States Marine Corps                                                 |
| USN    | United States Navy                                                         |
| UTM    | Universal Transverse Mercator                                              |

|       |                                        |
|-------|----------------------------------------|
| UW    | UnderWater                             |
| VHF   | Very High Frequency                    |
| VSTOL | Vertical Short Take-Off and Landing    |
| VTOL  | Vertical Take-Off and Landing          |
| VX    | Designation of a chemical nerve agent  |
| Warn  | Warning                                |
| WC    | Water Consumption                      |
| WIA   | Wounded In Action                      |
| WP    | White Phosphorus                       |
| Wpn   | Weapon                                 |
| WT    | Wheeled Trafficability                 |
| WX    | Weather                                |
| WZ    | Weather Zone                           |
| XMIT  | Transmit                               |
| ZULU  | Time referenced to Greenwich Mean Time |

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